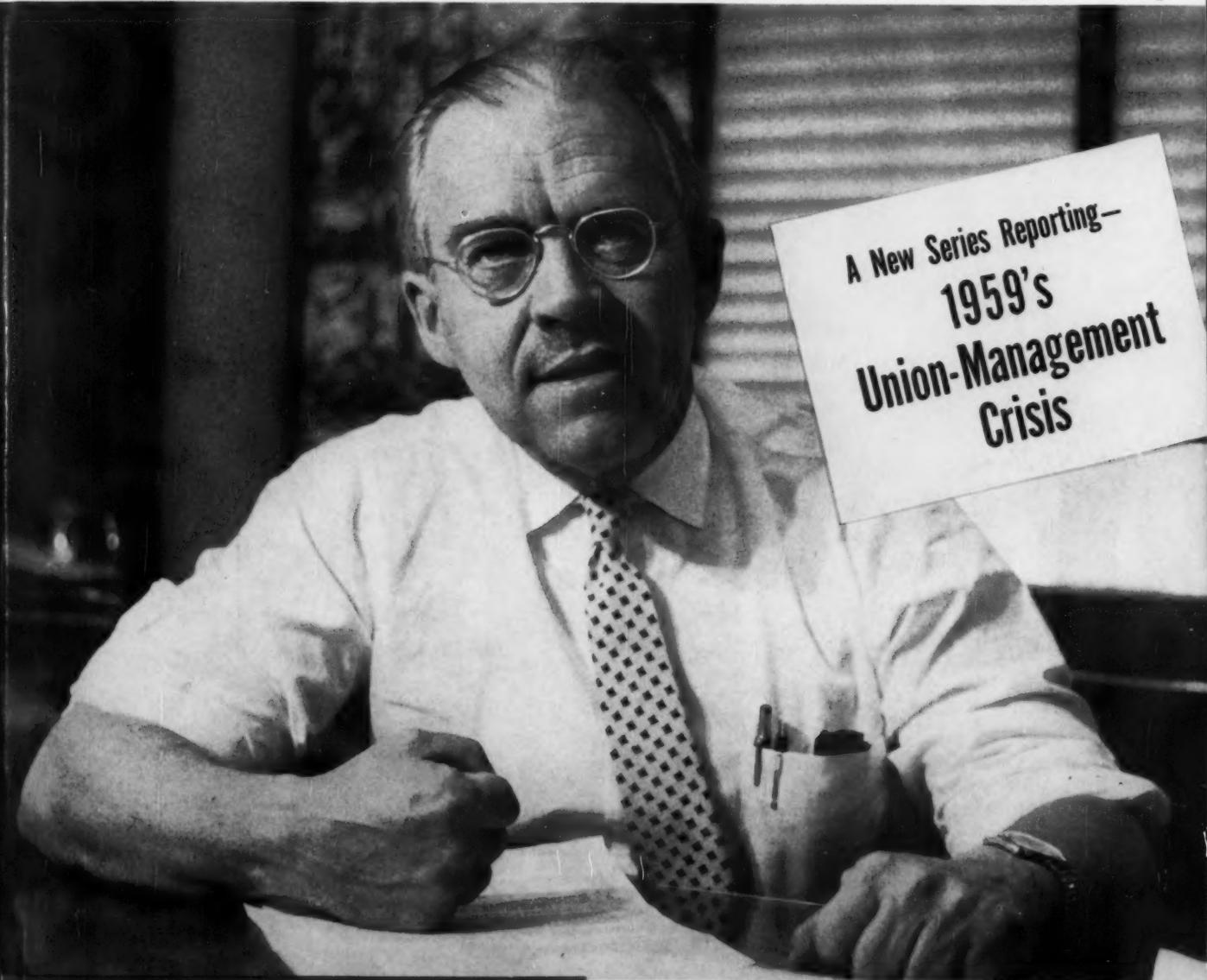


The IRON AGE

February 5, 1959

A Chilton Publication

The National Metalworking Weekly



Industrial Psychologist R. N. McMurry

Is Soft Management
The Real Cause Of
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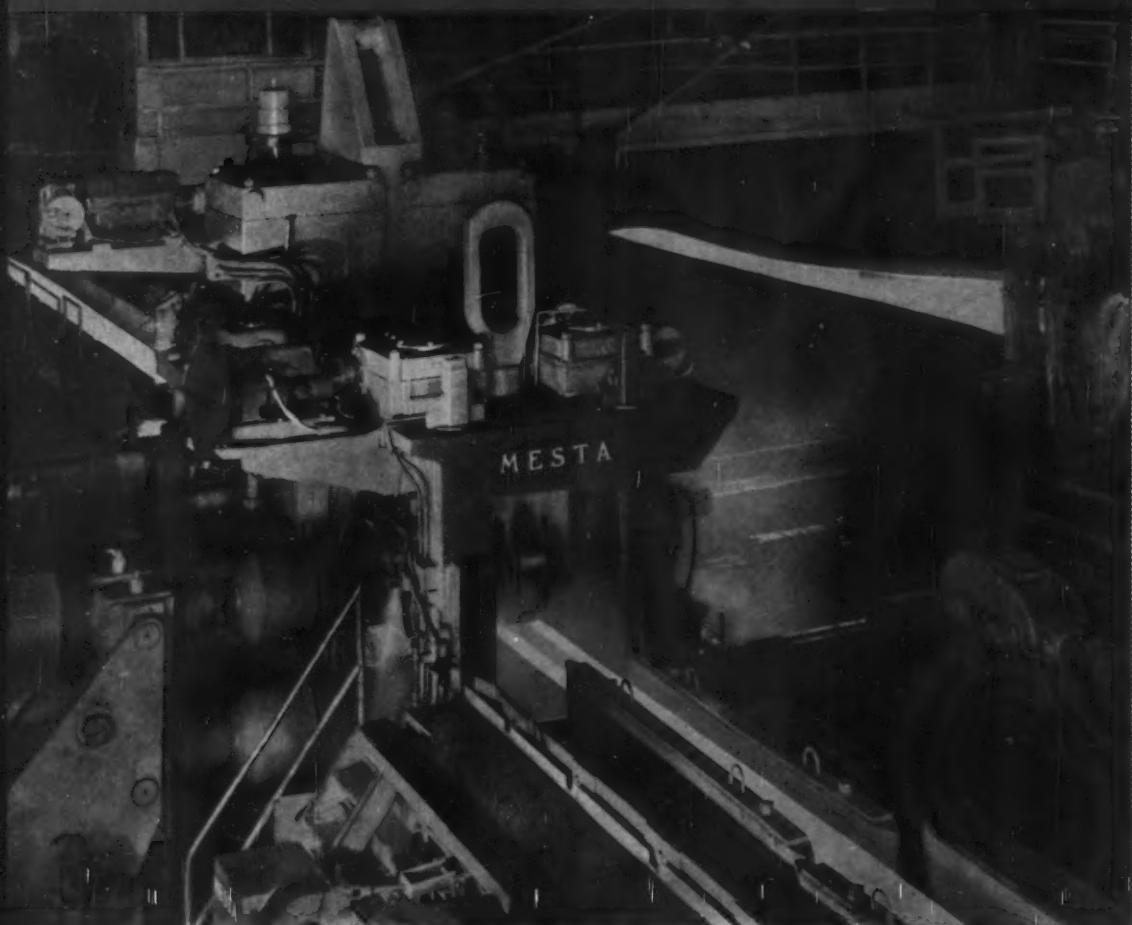
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Plastic "Sandwiches" — P. 83

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Yields Quality Steels—Vacuum stream-degassing capacity is further enlarged by a new installation that incorporates latest improvements. Among other features, this

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FIRST-LINE MANAGEMENT: Is your first-line management giving you labor troubles without your realizing it? Industrial psychologist Robert N. McMurry points out how management weakness is too often at the root of labor problems. P. 51

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ATOMIC ENERGY

Industry Perks Up—The faster pace is evident in AEC's 25th semi-annual report. Expenditures by government and industry last year increased 33 pct over 1957. P. 44

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How Aircraft Does It—Widening the sales base is nothing new for Farwest aircraft makers. But now they have a new approach—turning out more products for industrial customers. P. 61

STEEL JOCKEYING

Users Maneuver for Position—Steel users are jockeying for position on mill order books. The mills are doing their best to fit everybody in, but it's not easy. P. 127





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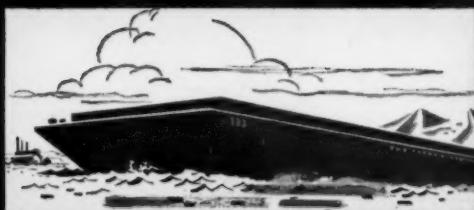
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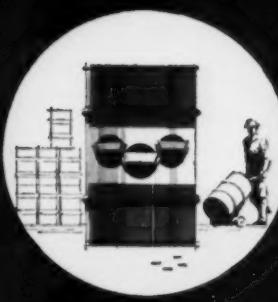
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Russian Trade Riddle

It's Not Hard to Answer

Every once in a while we must stand back and take a good hard look at the Russians. We did not do that recently. Many of us dropped our guard and almost—but not quite—fell for the Mikoyan trade talk.

It may sound like "this is where I came in," but it is necessary to repeat the truths about trade with the Reds. In the first place they want trade on their own terms. The items are what they want.

Time and again we hear that trade brings peace. That isn't true. Almost always, those who were about to shoot at each other were the best of friends—tradewise.

So we can dispense with the oft-repeated arguments that the Reds want trade with us for peaceful reasons. Or that it would be well for us to trade with them because it would soften the cold war. It wouldn't do that at all.

Often when we think of trade with the Reds we automatically think that the Russians have the highest intentions. They do have for themselves but not for us or for the Free World. There may be certain reasons why we cannot or should not tell our allies how to trade with the Reds. But even there it is a question of trying to keep

our nose out of their business that causes us to try to understand allies and their trade policies. It isn't because we feel trade with the Reds is a good thing.

Many of our Free World friends have found out too late that Red trade talk is mostly propaganda. It is now clear to many that what Russia wants and needs are those things that will make her strong—and a bigger threat than ever.

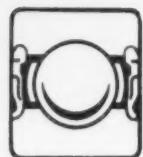
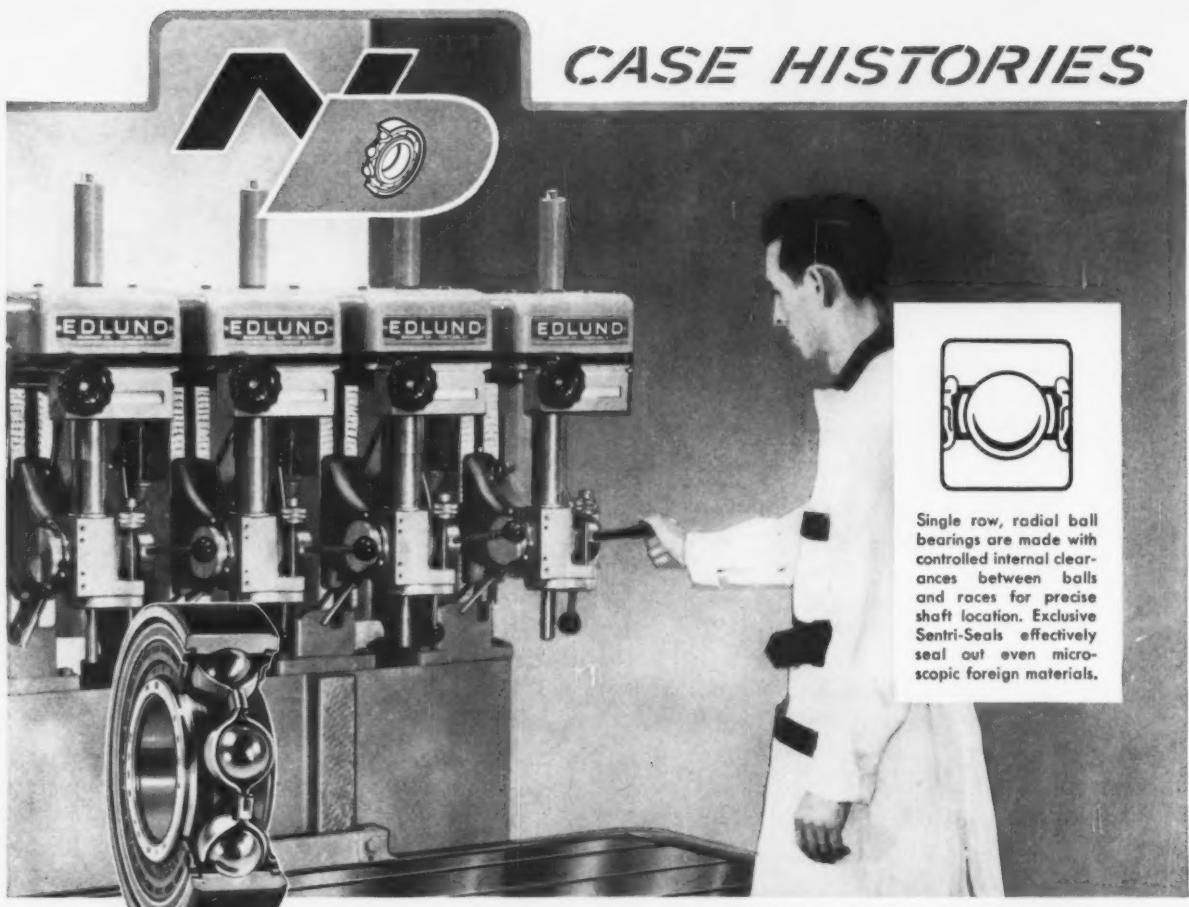
Also, the Russians are still in cahoots with the Red Chinese. What we ship to Russia will help her—and the Red Chinese. Certainly the bid of Mr. Anastas Mikoyan for a loan—and trade—was a clever one; had it worked. As Admiral Strauss, our new Commerce Secretary, points out, the Russians would want a few things only to copy them. Then the "new" trade would be as dead as a dodo bird.

By now it ought to be clear that cooing words—and failure by some Americans to recall past facts—do not produce a democratic and less aggressive Russia or Red China. There is really no riddle to this Red trade. They are just trying to play us for suckers—if they can.

It's up to us not to bite!

Tom Campbell
Editor-in-Chief

CASE HISTORIES



Single row, radial ball bearings are made with controlled internal clearances between balls and races for precise shaft location. Exclusive Sentri-Seals effectively seal out even microscopic foreign materials.

Photo: Courtesy Edlund Machinery Co., Cortland, N.Y.

N/D Ball Bearing Design Adds Efficiency... Cuts Relube Maintenance In Drilling Machine

CUSTOMER PROBLEM:

Tool manufacturer requires minimum maintenance ball bearing design for new high-speed multiple drilling machine.

SOLUTION:

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nance. In addition, these sealed bearings accounted for a savings in parts and assembly time by eliminating costly lubrication plumbing and fittings. What's more, the application has proved so successful, the customer has had other types of drilling machines redesigned to use New Departures.

If you're working on new machine designs, why not call on New Departure? There's probably an N/D *production* ball bearing that will help you, and, at a lower cost! For more information write Department S-2.

Replacement ball bearings available through United Motors System and its Independent Bearing Distributors

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Low Melting Point for Flux

Developed for induction brazing, or any other short-cycle brazing operation, a new flux has both a low melting point and low surface tension. It begins to melt at 480°F. At 800°F, it's water thin, when conventional fluxes are glycerin-thick. Covering even the smallest interstices of a joint, the flux prevents formation of oxide islands. The brazing alloy gently eases the flux from joints to prevent flux inclusions.

Probe Critical Carbides

What determines the maximum secondary hardening level in low-alloy steels containing vanadium or molybdenum? The basis of secondary hardening stems from forming of secondary carbides of these elements. But maximum hardening, according to a recent report, depends on a critical degree of fineness of the secondary carbide. Formation of these carbides follows the breakdown of metastable iron-carbide.

Quality Cuts Steel Output?

New quality and service demands may add to the coming steel squeeze. At one location, a mill finds its finishing capacity is 20 pct under the 1956 rating. One reason is the long term trend toward more finishing by the mills. The other is that quality was tightened in the slump period.

New Lamps Display Symbols

Thin, flat light-emitting plates can print out all numerals from 0 to 9, all letters of the alphabet, and selected symbols. In one rolling-mill application, the read-out lamps, in three widely separated arrays, notify personnel of production changes and the characteristics of each ingot in process. Characters are 2½-in. high and are read clearly from 50 ft.

Aluminum Aids Concrete Set

Embedded in the concrete structure of a dam during construction, 1-in. aluminum tubing serves as cooling coils. Water, circulating through the tubes, removes heat generated as concrete

hardens and helps prevent cracking. Advantages are low cost and easy handling of the tubing without need for mechanical tube benders. Use of aluminum also eliminates many points of leakage, since the only couplings are at inlet and outlet.

Polarization for Guidance

Use of polarized light for missile aiming systems is a major breakthrough in accuracy, affording better than 5" of arc. The system is said to apply to manned aircraft and space navigation. In fact, it will work in any setup depending on angular measurement.

Make Yttrium Metal Pliant

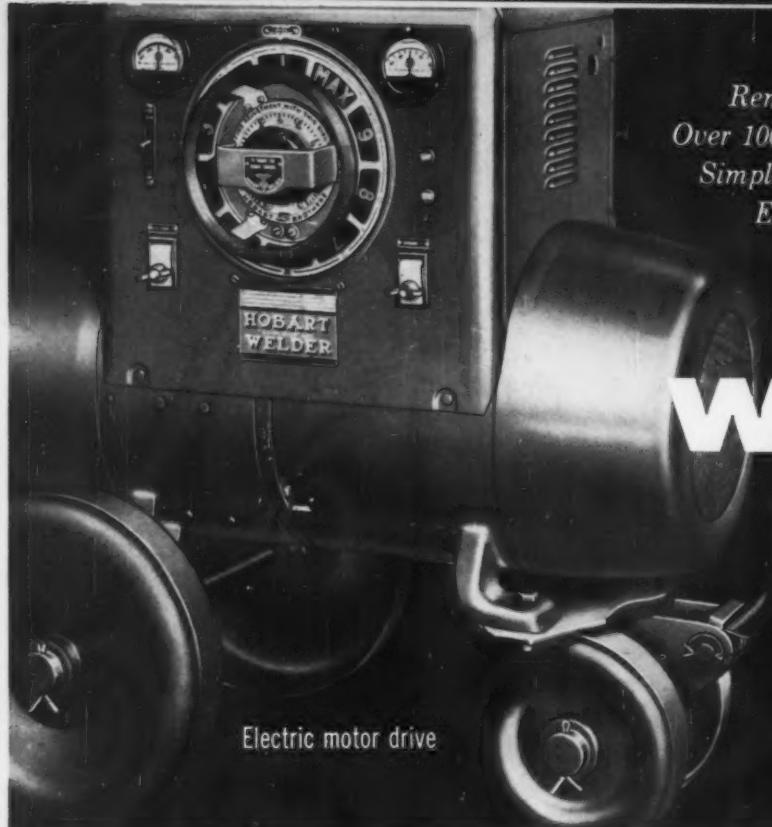
Yttrium metal, long considered too brittle for structural use, has been transformed into a pliant, easily formed material. It may be the answer to difficult problems in atomic-reactor design. Researchers have found that dissolved oxygen is the principal element limiting ductility. With only 0.02-pct oxygen, the high purity yttrium is so ductile, it can be cold-rolled to foil thickness.

Banks Urge Capital Spending

Banks are reported putting pressure on steel mills and others to step up capital spending. Under revolving credit plans, companies have tied up large sums at low interest rates. With regular interest going up, bankers would like to see money put to work. Bankers argue that deliveries and prices are favorable for spending.

Favor More Foreign Loans

A move is developing in Congress to beef up the Development Loan Fund for loans to foreign countries at the expense of gift phases of U. S. foreign aid. The Fund has received some \$600 million so far for loans. Ike wants to retain this level and increase foreign-aid grants by about \$700 million. But many congressmen favor boosting the loan fund to \$1 billion, and shaving the grants.



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LETTERS FROM READERS

Russian Soft Soap

Sir—I certainly was pleased to read your editorial "We and the Russians, Let Us Not Be Luniks" (Jan. 22 issue).

Such a well documented and forceful article in a magazine of the caliber of IRON AGE is a most valuable assist in combating the soft attitude recently exhibited by some industrialists, either in the hope of a quick gain or through mere misdirection. If this has not already been inserted in the Congressional Record, it is my intention to do so.—Styles Bridges, (R-N. H.), United States Senate.

Labor View

Sir—Your editorial "The Labor Outlook: It's Anything But Placid," (Jan. 8 issue) has been read with much interest.

I wonder if you have put fear into the hearts of the professional managers of the large corporations so few will stand up to the labor bosses and tell them the wage-price raise cycle year after year, (without accompanying increased production per man), must cease.

It is these administrators who must take the "bit in their teeth" and, after a proper publicity campaign, say NO to the labor bosses.

As every industrial leader knows, the more progressive corporations should enjoy a 10 pct to 15 pct annual export business for a profitable year. But already we have priced ourselves out of the export market because of the vastly lower wage rates in foreign countries enabling them to produce quality products below our costs, despite our automation.—J. C. Gorman, chairman, The Gorman-Rupp Co., Mansfield, O.

Waste Nitrogen

Sir—in the article "Waste Nitrogen Finds a Home," (Dec. 11, p. 97) it is stated: "For the first time in the steel industry, a mill will use as its sole source of annealing gas the nitrogen byproduct of its own oxygen plant."

The Steel Company of Wales Ltd. has been using waste nitrogen, from a tonnage oxygen plant, for annealing since July, 1954, in conjunction with British Oxygen Co. Ltd.

This installation was described by this writer in the "Proceedings from the International Symposium on The Annealing of Low Carbon Steel" held at Case Institute of Technology, Cleveland in October, 1957. The composition of the gas is: N₂—96.5%; H₂—3.5%;—O₂—10%.

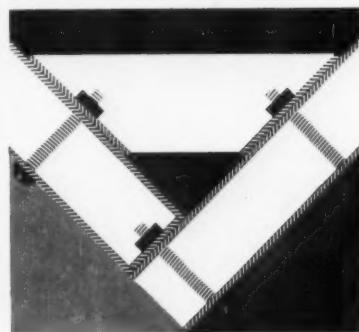
Total quantity of gas used is approximately 40,000 cu ft/ton and 12,000 tons of steel are annealed per week. This will shortly be increased to 17,000 tons per week.

—H. H. Ascough, Senior Supt., The Steel Co. of Wales Ltd., Port Talbot, Glamorgan.



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G. M. PAMPHILON, Chief Engineer, Johnson Gear, Berkeley, Calif., tells how book matches advertising sparks gear sales.

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- **125-D Paridon St., Springfield, Mass.**

FATIGUE CRACKS

Front Row Seat

This year has frequently been called the "year of decision" in labor relations.

The issues have never been stronger, nor has the determination of both union and management not to yield an inch on these issues as they see them.

Effects of wages on inflation, investigations of labor unions, and the upcoming battle on labor legislation only add to the intensity and broaden the range of interest in labor.

Then there's the big issue—the steel contracts to be negotiated this summer. All in all, labor will be a big, continuing story this year.

To add to our reputation as the top magazine in labor reporting in our field, we are organizing our coverage of the labor story to bring you the best possible labor views.

Spot news and interpretation of labor events as they happen will be interspersed with articles analyzing all the aspects of the field of labor relations.

The first of the new series reporting the 1959 Union-Management struggle appears on p. 51 of this issue. A provocative analysis of management weakness as a cause of labor troubles, it's written by Dr. Robert N. McMurry, prominent industrial psychologist and consultant in labor relations.

Too Much Coffee?

"We have to start doing a little less thinking about coffee breaks and a lot more thinking about our bread and butter." That's the word from L. S. Hamaker, general manager of sales for Republic Steel Corporation.

Mr. Hamaker, speaking at a sales conference, noted that "we have people all over the country

who are running away from responsibility."

He indicated too many people use up more energy thinking about their leisure time than they do about their means of earning a living.

"The sad truth is that all of us are infected with this virus in some degree," Mr. Hamaker said. "I don't mean that anyone deliberately loaf on the job, but some of the things that pass for work wouldn't stand up under cold-blooded inspection."

He added this attitude can be traced all the way back to the "school students who select cinch courses because the hard ones make them think."

New Puzzler

We've had a number of requests to repeat the cow puzzler that appeared here about a year ago, so here goes.

A farmer has a cow which he tethers to the end of a rope 110 ft long. The rope is attached to a corner of the barn which is rectangular and measures 40 ft by 60 ft. Disregarding the thickness of the rope and considering 110 ft as the extreme distance the cow can reach, what is the total grazing area around the barn?



For extra protection, extra wear . . .

NORTH PVC GLOVES

Good reasons!

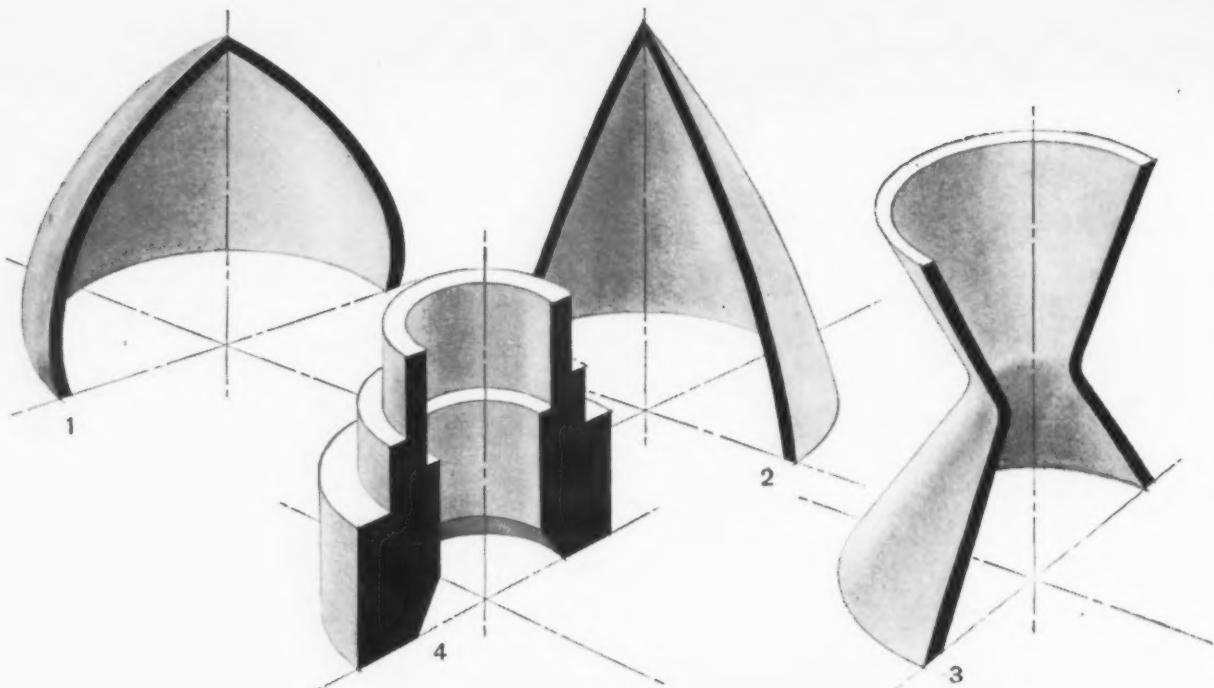
- **Outwear** other types two to five times
- **Have excellent pliability**, afford extra comfort and dexterity
- **Chemical-resistant** PVC compound withstands almost all acids, alkalis and solvents
- **Nonaging**, nonoxidizing and nonflammable

Bring your safety rules up to date! Make sure that your employees have the best hand protection available—North PVC Gloves. Not only will they give better protection, but they'll wear and wear.

Tell us your working conditions on your letterhead and we'll be glad to send you a free pair.

JOMAC Inc.

Dept. K, Philadelphia 38, Pa.
Associated Dealers and Distributors
Throughout the World



how to Vertical Grind missile shapes

Complex missile shapes such as these, weighing hundreds or thousands of pounds, can be ground accurately on a Springfield vertical contour grinder. These machines are equally at home grinding ceramics, plastics, metals or combinations of materials. Domes (1) of any shape or Cones (2) demanding extreme concentricity can be contour ground on a Springfield. Ceramic coated parts (3) or complex orifices (4) are naturals for grinding on a standard Springfield vertical.

If your missile shapes, *no matter what size*, require contour grinding or have taper holes, irregular holes, offsets, undercuts or angles—we'd like to show you how the Springfield principle of vertical grinding can work for you. Mail the coupon today, for your free and informative copy of "Vertical Universal Grinders"; Bulletin 197-E.

THE SPRINGFIELD MACHINE TOOL CO., SPRINGFIELD, OHIO

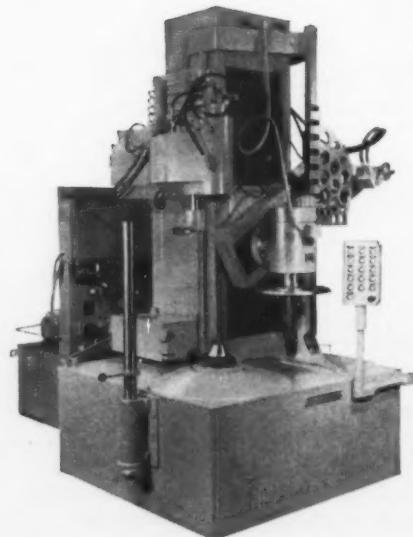


name & title _____

company _____

address _____

city, zone, state _____



This machine accurately grinds a compound-curve dome. Both the grinding wheel and a single point tool follow a precision template. Automatic parting tools remove excess stock, top and bottom.

COMING EXHIBITS

Western Metal Show—March 16-20, Pan-Pacific Auditorium and Ambassador Hotel, Los Angeles. (American Society for Metals, 7301 Euclid Ave., Cleveland 3.)

Corrosion Show—March 16-20, Chicago. (National Assn. of Corrosion Engineers, 1061 M & M Bldg., Houston 2, Texas.)

1959 Nuclear Congress—Apr. 5-9, Cleveland Auditorium, Cleveland. (Engineers Joint Council, 29 W. 39th St., New York 18.)

Welding Show—Apr. 6-10, International Amphitheatre, Chicago. (American Welding Society, 33 W. 30th St., New York.)

Engineered Castings Show—Apr. 13-17, Sherman and Morrison Hotels, Chicago. (American Foundrymen's Society, Golf & Wolf Rds., Des Plaines, Ill.)

Packaging Exposition—Apr. 13-17, International Amphitheatre, Chicago. (American Management Assn., 1515 Broadway, N. Y.)

Powder Metallurgy Show—Apr. 20-22, Sheraton - Cadillac Hotel, Detroit. (Metal Powder Industries Federation, 130 W. 42nd St., New York 36.)

Design Engineering Show—May 25-28, Convention Hall, Philadelphia. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

Material Handling Show—June 9-12, Public Auditorium, Cleveland. (Hanson & Shea, Inc., One Gateway Center, Pittsburgh 22.)

MEETINGS

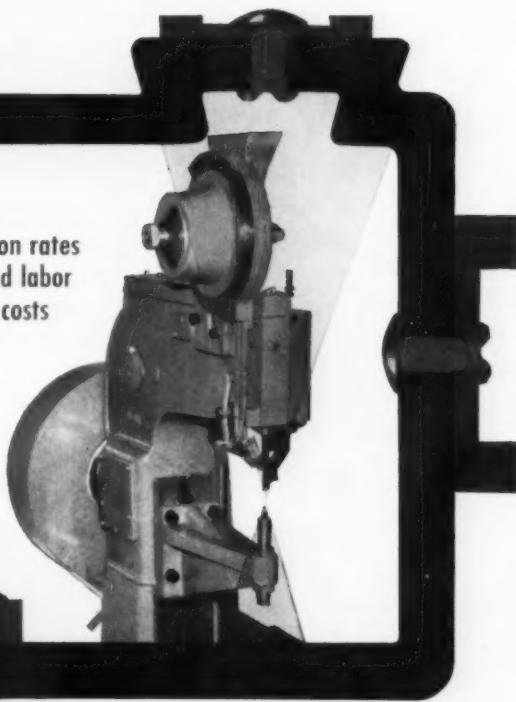
FEBRUARY

American Management Assn.—Marketing conference, Feb. 9-11, Statler-Hilton Hotel, New York. Association headquarters, 1515 Broadway, New York 36.

(Continued on P. 16)

Odd shapes are no problem for the new Townsend Model 75 Tubular Rivet Setting Machine

**High production rates
using unskilled labor
cut fastening costs**



Skillfully designed tooling gives complete versatility to the new Townsend Model 75 Tubular Rivet Setting Machine. A variety of specialized tooling is available to equip the Townsend machines for any size and shape of work.

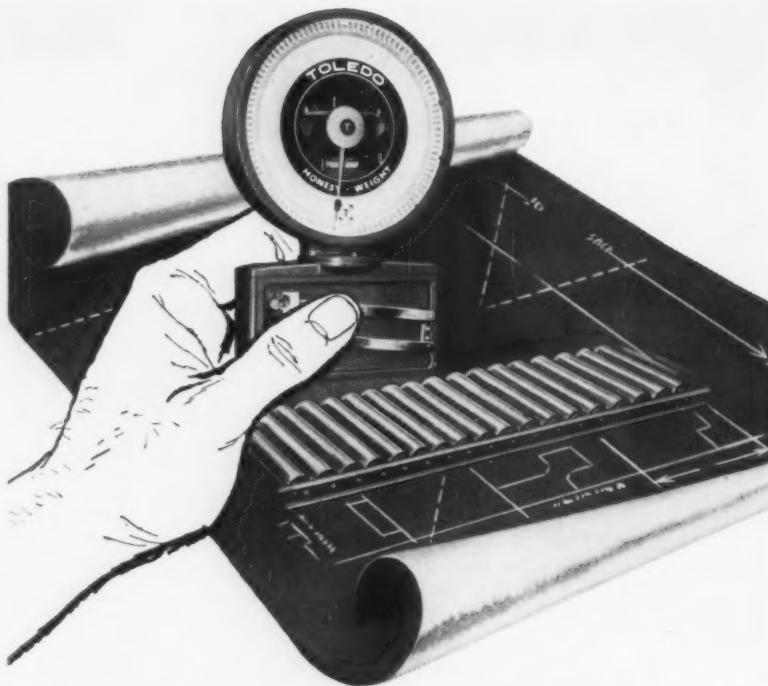
Townsend tubular rivets are available in steel, aluminum, copper, brass, nickel-silver and special materials for use in joining anything from cloth to steel sheets. Thus, Townsend makes available the economies of tubular rivet fastening for a wide range of products in a number of different materials. Townsend's experienced fastening engineers provide application design service.

If you wish to enjoy the economies of fastening with tubular rivets, write for complete information on the versatile Model 75 Setting Machine and the complete line of Townsend tubular rivets. Townsend Company, P. O. Box 237-B, New Brighton, Pa.

Townsend
COMPANY • ESTABLISHED 1816

Sales Offices in Principal Cities

In Canada: Fermenter & Bullock Manufacturing Company, Limited, Gananoque, Ontario



**the cost-saving trend today
puts BETTER CONTROL
where it counts most!**

On industry's scales, materials become money. Weight records directly affect costs, quality, inventories and customer billing. That's why it is so vitally important to put *Toledos* at all weighing points . . . where control counts most!

Major advantages that are yours with *Toledos* are being proven daily in plants of every size. *Toledos* provide more complete cost data . . . greater selection of models . . . savings in time and materials . . . welcome new simplification of records and record keeping. You can even carry *Toledo* accuracy directly into your accounting and inventory records, through weights printed at the scale, or transmitted on "electronic wings" for remote recording.

There are specialized *Toledo* units, too, for classifying, testing, counting, automatic batching and bulk weight control. So, whatever your weighing need, you need *Toledos*. To help you evaluate weighing efficiency in your plant, send for the *Toledo* weighing analysis kit. No obligation. **TOLEDO SCALE**, Division of *Toledo Scale Corporation*, Toledo 12, Ohio.



. . . complete printed weight records at your fingertips!

- Prints where you wish on full 8½" x 11" forms, or on tickets; also on strips.
- Prints full figures, even when unit weights are used.
- 6 to 12 bank selective numbering, or up to 10 weight symbol keys available for weight identification. Consecutive numbering.
- Date and time may be printed automatically.
- Transmits weight data for recording by remotely located office machines, if desired.

Ask for Bulletin 2017



TOLEDO®

Greatest Name in Weighing

EXHIBITS, MEETINGS

(Continued from P. 15)

The Metallurgical Society of AIME—Annual meeting, Feb. 15-19, St. Francis, Sheraton-Palace, and Sir Francis Drake Hotels, San Francisco. Society headquarters, 29 W. 39th St., New York.

Association of Steel Distributors, Inc.—Annual convention, Feb. 15-21, The British Colonial Hotel, Nassau, Bahama Islands. Association headquarters, 29 Broadway, New York 6, N. Y.

American Management Assn.—Mid-winter personnel conference, Feb. 16-18, Palmer House, Chicago. Association headquarters, 1515 Broadway, New York 36.

Malleable Founders' Society—Technical & operating conference, Feb. 18-19, Park Manor Hotel, Cleveland. Society headquarters, 1800 Union Commerce Bldg., Cleveland 14.

Alloy Casting Institute—Winter meeting, Feb. 26-27, Boca Raton Hotel, Boca Raton, Fla. Institute headquarters, 286 Old Country Rd., Mineola, N. Y.

MARCH

Steel Founders' Society of America—Annual meeting, Mar. 9-10, Drake Hotel, Chicago. Society headquarters, 606 Terminal Tower, Cleveland.

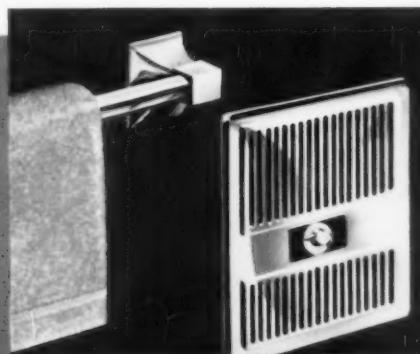
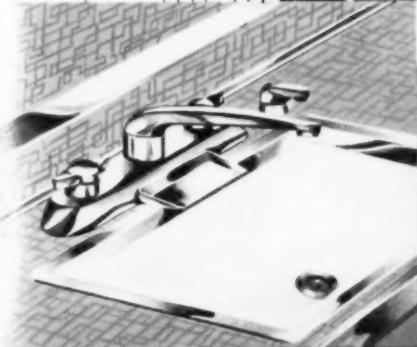
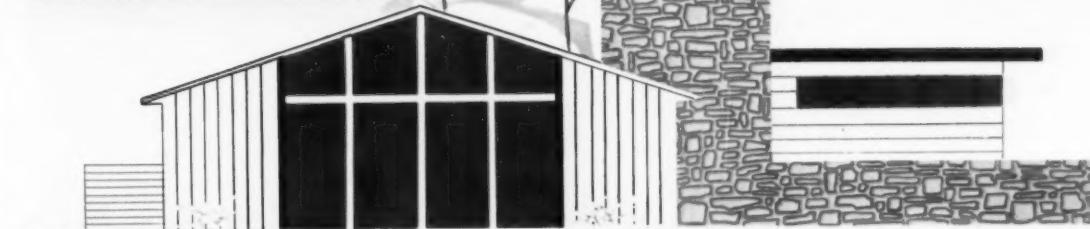
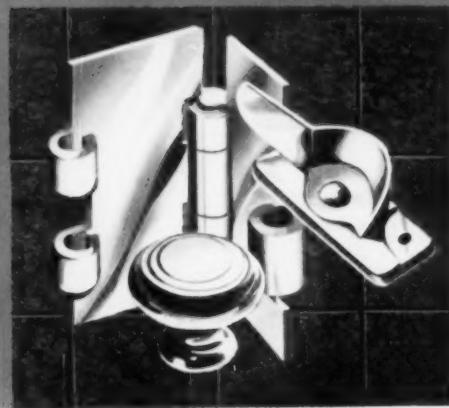
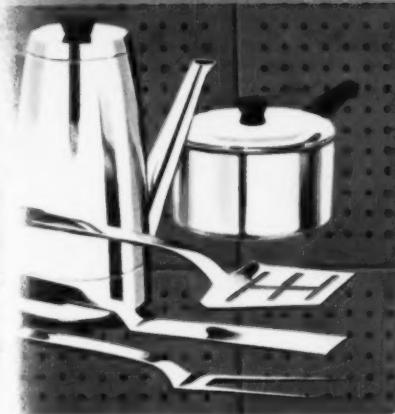
International Acetylene Assn.—Annual convention, Mar. 9-10, Hotel Roosevelt, New Orleans, La. Association headquarters, 30 E. 42nd St., New York 17.

Pressed Metal Institute—Annual spring technical meeting, Mar. 11-13, Pick-Congress Hotel, Chicago. Institute headquarters, 3673 Lee Rd., Cleveland 20.

Society for Non-destructive Testing, Inc.—Western regional convention, Mar. 16-20, Ambassador Hotel, Los Angeles. Society headquarters, 1109 Hinman St., Evanson, Ill.

Fine to have around the house

for every stainless reason!



Superior
STAINLESS STRIP STEEL

At every turn, stainless serves in the modern home . . . brightens the decor, lightens every cleaning chore! From Superior Stainless Strip Steel, precise in specification for each specified need, are made scores of tarnish-proof, wear-resisting, care-banishing home products.

- Let us discuss our steels and your fabrication possibilities, without obligation of any kind.

Superior Steel Division

OF

COPPERWELD STEEL COMPANY
CARNEGIE, PENNSYLVANIA

For Export: Copperweld Steel International Company, New York



An Entire Plant Can be Protected with these
**NEW AO ULTRASCOPIC
SAFETY GLASSES**
— for the Cost of ONE Serious Eye Accident

Cost of compensation alone for a major eye accident can be \$10,000 or more. The cost of safety glasses that can prevent the accident is infinitesimal in comparison.

THESE NEW AO ULTRASCOPIC SAFETY GLASSES IN PINK CRYSTAL OR MAHOGANY are available with and without side shields. They have all the safety features of our onyx on crystal frame series including heavier eyewire and bridge — the patented eyewire specially engineered to support lens against deflection toward eye if struck — an exclusive AO feature. Perforations in side shields control fogging, shield contour makes fitting easier and protects like a cup goggle. Give this handsome, comfortable eye protection to your workers. Your nearest AO Safety Products Representative can supply you.

Always Insist on
AO Trademarked
Safety Products

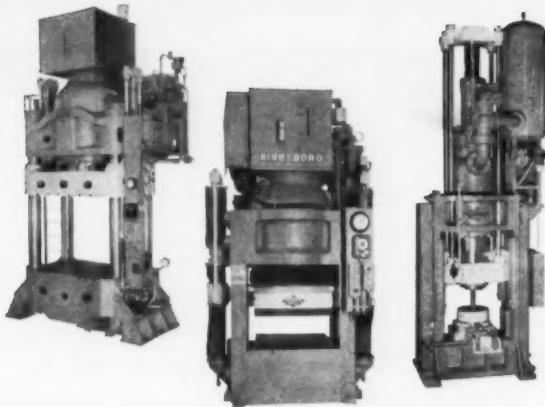


QUICK FACTS

- 44, 46, 48 eye sizes (42 without side shields)
- 18, 20, 22, 24, 26 bridge sizes
- Comfort cable and spatula temples
- Frames — flame-resistant cellulose acetate butyrate
- Bridge — sturdy, face-formed
- Nose Pads — wide for comfort — rocking pads also available
- Lenses — symmetric, no rights or lefts. Planos interchangeable. 6 Curve Clear Super Armorplate or 6 Curve Calobar Super Armorplate. May be ground to worker's prescription.
- AO Plaque — you can't miss it and you can't miss obtaining true safety frames when you see it.

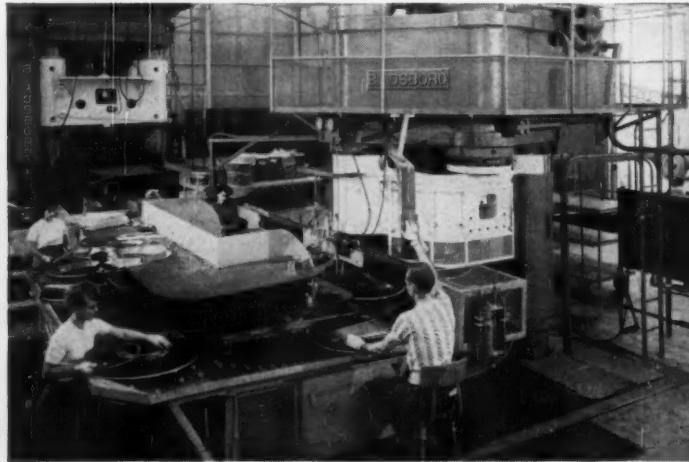
SOUTHBIDGE, MASSACHUSETTS
Safety Service Centers
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*Get the most from
both men and machines...
with advanced design*
BIRDSBORO Hydraulic Presses



- Getting the most from your production crews depends a great deal on the equipment, and getting the most from your equipment depends a great deal on its design. As the importance of design increases, BIRDSBORO's emphasis on this factor has increased. Several BIRDSBORO hydraulic presses are being used in research today to determine the design

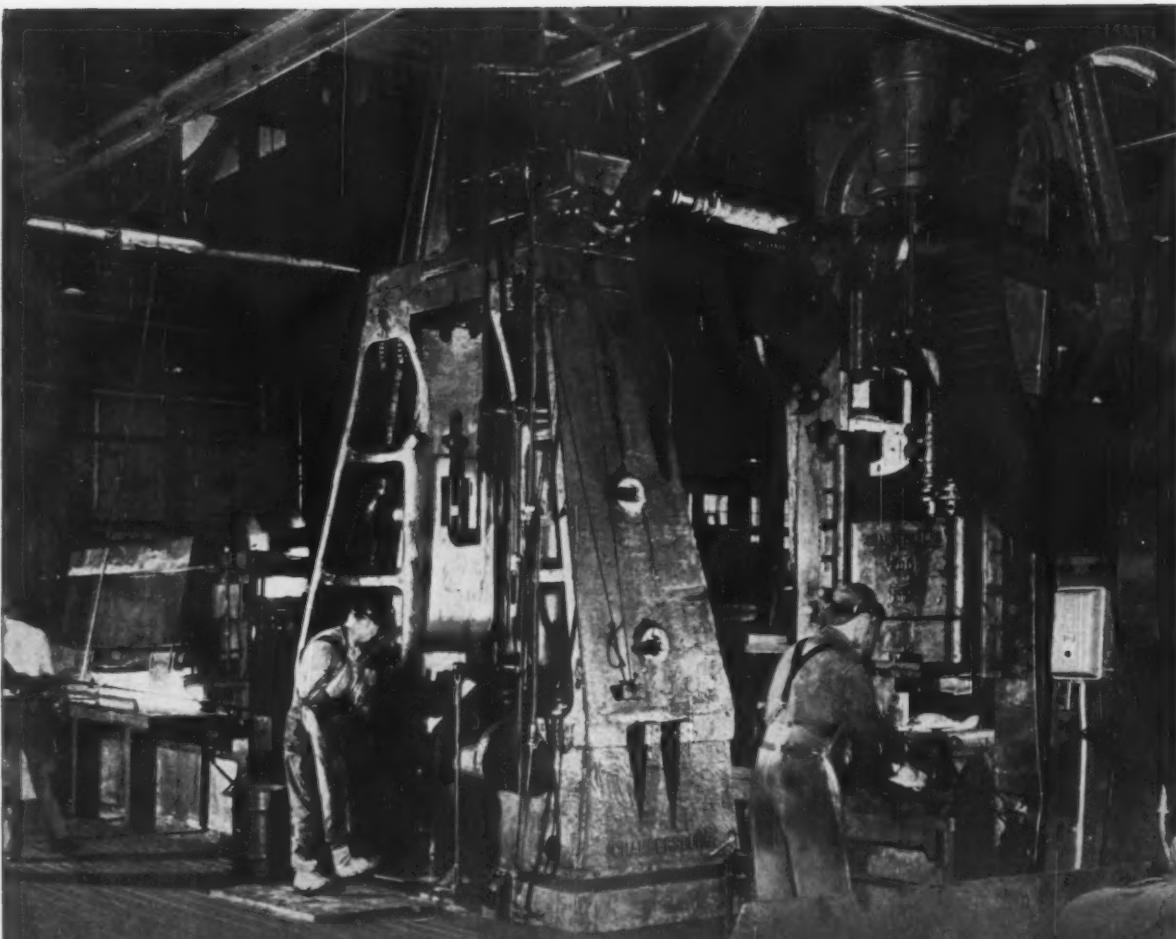
features that will be needed to meet the performance requirements of tomorrow. Advanced design and versatility go into every press by BIRDSBORO. For reports on what they can mean to you, contact your BIRDSBORO representative. *Sales Department: Reading, Pa., Engineering Department and Plant: Birdsboro, Pa., District Office: Pittsburgh, Pa.*



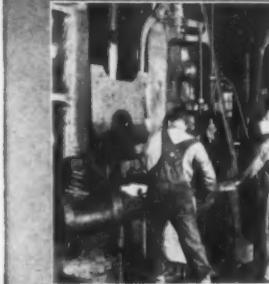
BIRDSBORO
STEEL FOUNDRY AND MACHINE CO.

STEEL MILL MACHINERY • HYDRAULIC PRESSES • CRUSHING MACHINERY • SPECIAL MACHINERY •
STEEL CASTINGS • Weldments "CAST-WELD" Design • ROLLS: Steel, Alloy Iron, Alloy Steel

HP-39-69



Production Increased 30%



Shown here is a 6000 lb. Chambersburg Steam Drop Hammer and a No. 200 Chambersburg Steel Side Trimming Press installed in a forge shop specializing in railroad car parts, gear blanks and general job forging. A 2000 lb. hammer and a No. 100 Trimmer are also installed. Hammers operate on air.

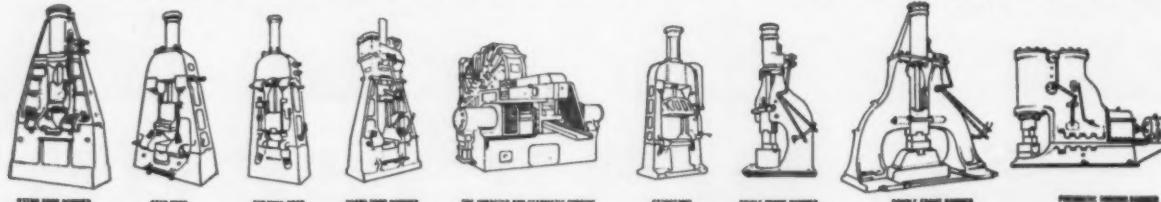
In replacing older hammers, the Chambersburgs were selected for

the accuracy and quality of their manufacture. Experience to date shows maintenance costs are lowered, rejects are fewer, less down time is required, and as a result management figures production is up 30%!

If you are interested in getting similar results in your own shop, write for a copy of Bulletin 55-L-4.

CHAMBERSBURG • The Hammer Builders

CHAMBERSBURG ENGINEERING COMPANY CHAMBERSBURG, PENNSYLVANIA



COOPER**ALLOY****CASTINGS****BRIEFS****THE CASTINGS ANSWER CORNER**

**Carl Tyka, Cooper Alloy
Technical Service Director,
answers your questions on
stainless steel castings**

Q. Cooper Alloy has recently publicized the production of stainless castings having higher physical properties than required by code. Does this result in any economies in construction?

A. Yes, definitely. For ASME Boiler and Pressure Vessel Code designs, the casting's higher strength will increase the inherent design safety factor. For non-code designs, the higher strengths will make possible lighter wall sections. Both these features will make for more economical use of materials.

Q. Does magnetism in an 18-8 stainless steel mean that the material's composition falls outside the normal specification range?

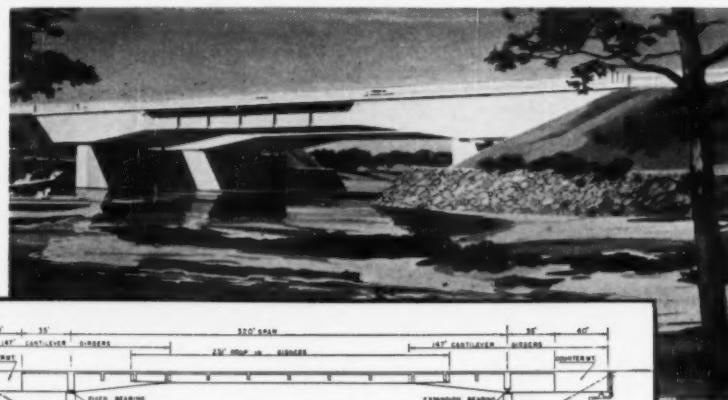
A. No. Magnetism of an 18-8 stainless depends on its ferrite content, which is variable within the boundaries of composition specs (e.g., ASTM A351, Grade CF8), and may be estimated by Schaeffler's method. Magnetism can be controlled through both chemical composition and heat treatment.

Q. Shrink in stainless castings seems to be a common fault. Can it be avoided so as to make repair welding unnecessary?

A. Yes, casting shrink can be avoided by proper mold design which allows for optimum metal flow, heading, and gating, and which provides progressive solidification through use of predetermined drafts or tapers. We do it all the time at Cooper Alloy.

Q. Can ultrasonic testing give as reliable results as do X-Rays in quality control of stainless castings?

A. No. Ultrasonic testing of stainless castings is not a feasible quality control method at present, because of difficulties of test interpretation. The inherent large grain structure of castings does not lend itself to this type test. To date, no satisfactory correlation or basis of interpretation of ultrasonic tests has been devised.



Cast Stainless Steel Bearings and Bearing Plates To Be Used on Nation's Longest Post-Tensioned Concrete Bridge Span

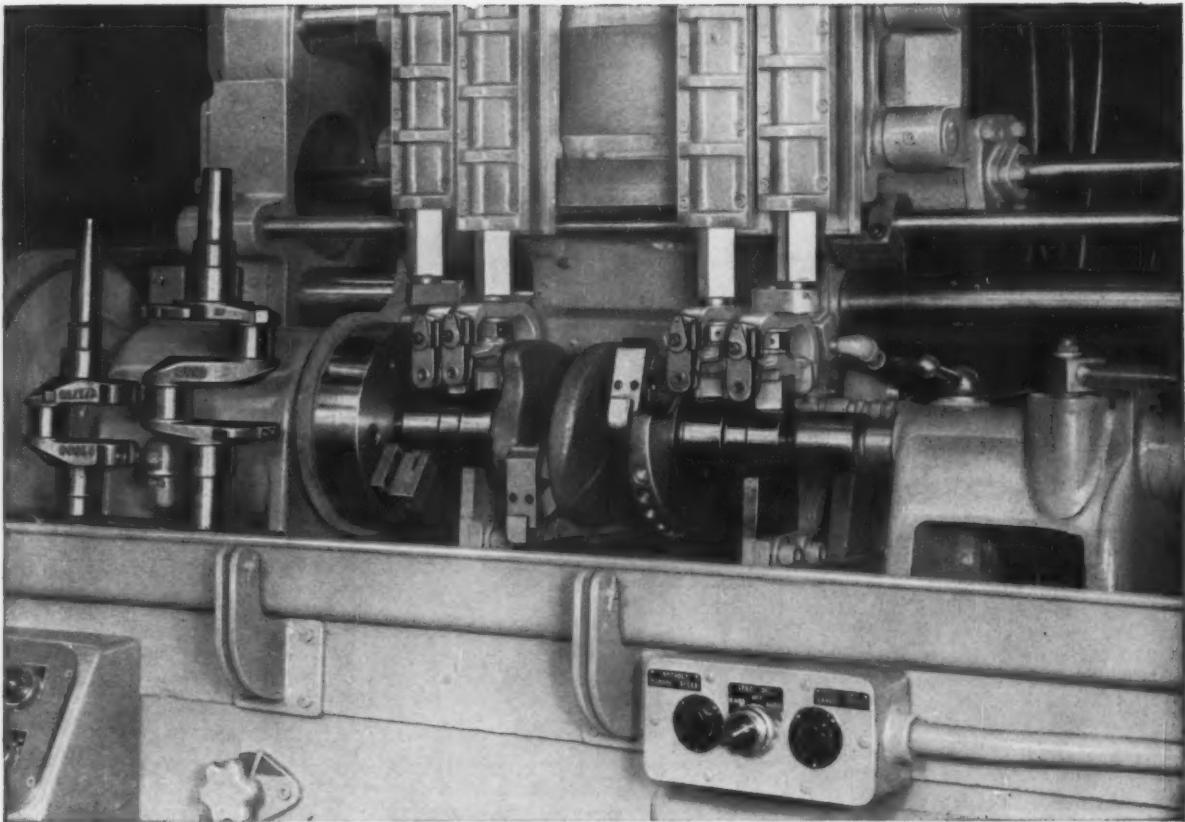
Will eliminate maintenance, provide long-range economies

Some 175,000 lbs. of machined Cooper Alloy stainless castings will soon be in use as bearings and bridge plates, on the longest post-tensioned concrete bridge span in the Western Hemisphere: the Oneida Lake Bridge on New York's Empire Stateway, now under construction at Brewerton, N. Y. Bridge spread is 470 ft. between abutments, with center span of 320 ft.

Normally such elements are made of carbon steel, but stainless was found by the designers, Summers & Munninger of Albany, N. Y., to provide two major advantages: greater strength per pound, which permits better load handling in the limited space available; and complete elimination of maintenance. Latter alone will save New York State hundreds of dollars annually in painting and upkeep, and allow the entire cost of the castings to be amortized in 8-10 years.

The stainless bearings, 20 in all, will allow for bridge expansion and contraction under varying weather conditions. Located between girders and piers, and between girders and abutments, they are of three types: abutment bearings (18"x9"x9") at each end of the bridge; expansion bearings (33"x40"x11") at the north pier; and fixed bearings at the south pier. Alloy used was ASTM A296-55, Grade CA-15 (12%Cr), having a min. tensile of 90,000 psi, and min. yield of 65,000 psi.

This unusual application of stainless steel castings is but one illustration of the many ways in which a creative adaptation of stainless castings can solve a perplexing equipment and maintenance problem. For further information on what stainless castings can do for you, write to Technical Service Department, Cooper Alloy Corporation, Hillside, New Jersey.



Gisholt 51A General-Purpose Superfinisher handles 44 to 53 crankshafts an hour with 80% efficiency—with one-hour change-over from one crank size to another. Each set of stones Superfinishes over 200 crankshafts on this job.

What Onan is doing with Superfinish

Handles crankshaft mains, pin bearings and oil seals simultaneously...gets finer finish at lower cost

There may be a tip for you in the way D. W. Onan and Sons, Inc., Minneapolis, is finishing crankshafts on a high-production basis.

Here's how a Gisholt Model 51A Superfinisher handles up to 6 different diameters in one operation, finishing a variety of single- and 2-throw crankshafts. Loading rails, with a special spindle-inching arrangement for driver positioning, make loading and unloading larger pieces fast and simple.

In a typical operating cycle, the crankshaft is driven between centers from the keyway, using a faceplate driver. Two special latch-on, follower-type arms engage with the crank pins, and 4 longitudinally adjustable quills descend to Superfinish main bearing and oil seal surfaces. Main and pin bearings are reduced from a ground surface of 30 micro-inches RMS to 8 or less. Oil

seal surfaces on the shaft ends are Superfinished to 4 micro-inches or less.

Gisholt Superfinishing helps market your product more easily against rising competition. By reducing—or even eliminating—the cost of grinding, polishing, lapping or buffing operations, this modern method provides substantial savings. Chatter marks, grinding flats and amorphous "smear" metal left by grinding are completely removed, exposing true base metal for longer wear and better performance.

Ask your Gisholt Representative for details on the complete line of Superfinishing machines—including Superfinisher attachments, general-purpose models for job-lot production, and high-production models adaptable for automation. Make an appointment with him today—get the facts on this inexpensive process.



GISHOLT

MACHINE COMPANY

Madison 10, Wisconsin, U.S.A.

WRITE TODAY for "Superfinishers" (Form 1169-A), 30-page illustrated booklet explaining Gisholt Superfinishing process in interesting detail.

ASK YOUR GISHOLT REPRESENTATIVE ABOUT GISHOLT FACTORY REBUILT MACHINES WITH NEW MACHINE GUARANTEE

a "NEW LEAF" in coolants... New

100%

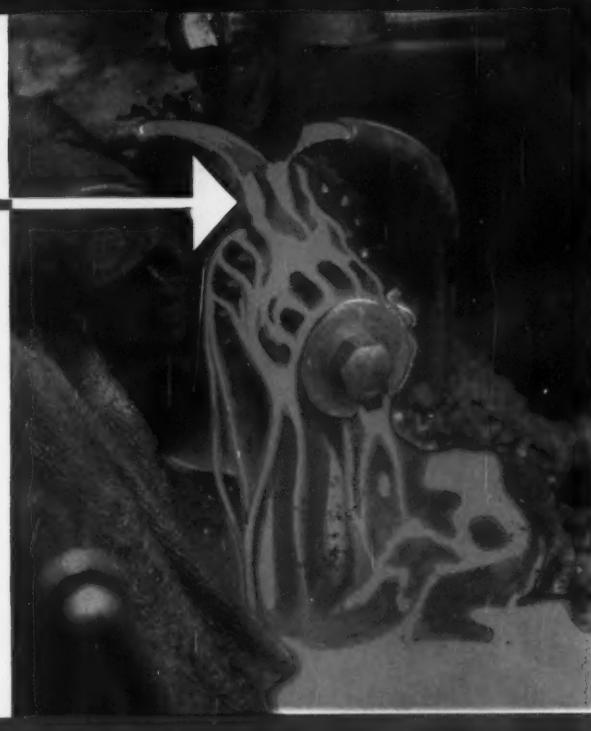
Chem-
Cool
HOCUT

cools...
lubricates...
prevents rust...
stays mint-fresh for life!

At the
point of proof

**NEW
HOCUT
237**

rests its case!



Industry's newest synthetic cutting fluid—new HOCUT 237—was just introduced within the past year. Yet, in these few months it has proved itself one of the most versatile, effective and economical coolants ever to appear on the metalworking scene.

Already our files are filling with proven case histories* of new savings and new efficiencies our customers are getting with new HOCUT 237. Here are some of the reasons why this unique new all-chemical coolant has earned such quick acceptance:

*yours on request

• **Permanently odor-free**

Needs no "additive" to stay clear and fresh-smelling for life. Cannot turn rancid or harm hands. Keeps your shop clean and your operators happy.

• **Cools work and tools quickly**

Faster cooling speeds machining time—prevents welding and chip build-up, and increases tool life.

• **A lubricant that works**

The secret is in a new synthetic high-molecular-weight

lubricity additive—which, in plain language, means all the lubrication advantages of a "soluble oil"—with none of the disadvantages.

• **Protects tools and work from rust**

Work coming off the machine is coated with a two-stage rust preventive. Tools, ways, slides and bearings get real protection.

• **Best for economy**

Initial cost is only a few pennies per gallon in the machine. Expense of clogged filters is eliminated and filtration speeded up. HOCUT can be used and re-used for months. Disposal is never a problem.

You can get all these benefits of new HOCUT 237 in your own plant by calling your Houghton representative today. Or write: E. F. Houghton & Co., 303 W. Lehigh Avenue, Philadelphia 33, Pa.

HOCUT 237...a product of

E. F. HOUGHTON & CO.
PHILADELPHIA - CHICAGO - DETROIT - SAN FRANCISCO - TORONTO

Ready to give you on-the-job service





EASTERN TIPS THE SCALE IN YOUR FAVOR

A ton of Eastern stainless steel sheet weighs the usual 2,000 pounds. But Eastern's precision rolling, by keeping the gauge toward the light side of recognized tolerances, delivers more square feet of stainless per ton.

Since you buy by the pound and sell by the square foot, that means more dollars per ton . . . in your favor!

Lighten your costs with Eastern's precision rolled stainless.

OFFICIAL TOLERANCE RANGE

HEAVY LIMIT

EXACT GAUGE

LIGHT LIMIT



EASTERN STAINLESS STEEL CORPORATION • BALTIMORE 3, MARYLAND

20 21 22 23 24 25 26 27

BIG-BY 2 YARDSTICKS!



Heavy duty lathes are intended primarily for heavy stock removal from large work having considerable weight. But more than massive machine components and swing capacity are required. The basic consideration is almost always greater production, therefore lowered costs.

This you get in the Monarch Series 80 Heavy Duty Dyna-Shift—an ultra-modern machine which will remove more metal at any speed than is possible on any other heavy duty lathes. Maximum production results because the machine can be kept under full load during the entire cutting cycle. Major contributing factors are more machine output per unit

of power input, less operator effort, reduced maintenance and ease of supervision.

Performance reports from the field reveal production increases of 25% or more along with a like improvement in tool life. As always, invest in the best—the cheapest in the long run. The Series 80 includes two separate machines—two models for work requiring 25"-30" clearance diameter, 16"-20" swing over cross slide and three models for larger and heavier work in the range of 32"-40" clearance diameter and 20"-28" swing over cross slide.

These machines are big in size and even bigger in productivity—Ask for Booklet 1603.

THE MONARCH MACHINE TOOL COMPANY, SIDNEY, OHIO

PRODUCTIVITY



ELECTRICALS RIGHT WHERE THEY BELONG

1. External main drive motor mounting and external electrical control mounting (either NEMA or JIC) for quick accessibility.
2. Motor mounted on hydraulic system sump also supplies power for hydraulic pump.

PROTECTED GEAR BOX AND END GEARING

1. Both the gear box and end gearing are totally enclosed. Lubrication is kept in, dirt kept out, original accuracy maintained.

SPECIAL INTERLOCKS—SAFETY FIRST

1. When machine is started, the brake engages automatically, preventing spindle rotation regardless of main control lever position.
2. No speed shift can be made with spindle rotating. More than anything else this preserves the original accuracy of headstock gearing.
3. Leadscrew and feed rod cannot be engaged simultaneously; neither can feed and power rapid traverse.

29

30

31

32

33

34

35

36

WEIGHT



THE HEADSTOCK THAT THINKS

1. 36 speeds—range 10 to 1250 R.P.M. on some models, 8 to 1000 R.P.M. on other models—ratio 1 to 125. Standard range low enough, high enough, with plenty of speeds in between to provide reasonably constant surface cutting speed on most work.
2. Operator works in terms of surface cutting speed. Machine automatically figures correct R.P.M. and sets up shift. Operator sets two dials—one for work diameter, the

other for desired surface speed. A speed indicator always shows the R.P.M. in engagement.

3. Flip of a lever gives free spindle in a jiffy. And there is a generous 3-1/16" or 3-9/16" hole through the spindle.
4. Hydraulic brake and clutch are self-adjusting for wear. Being under automatic machine control regardless of load, operator needs not supply power for engagement.



APRON—THE CONTROL CENTER OPERATORS GO FOR

1. Provided with four-way, hydraulic, variable speed power rapid traverse. Both carriage and cross slide traverse may be engaged simultaneously. Infinitely variable speed feature permits such extremely close control that manual handwheel traverse is virtually eliminated.
2. Apron and cross feed handwheels automatically disengage during traverse as a

safety feature. A single jaw clutch in each mechanism causes feed pick-up at the same point after any traverse movement.

3. Positive, cam controlled feed frictions. Application is such that machine never loses its chip under the heaviest of cuts.
4. All controls located to permit operation from a stand-up position—no stooping or stretching necessary.

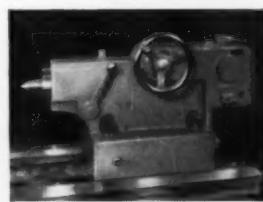


THE BED—SOLID AS GIBRALTER

1. All four bed ways flame hardened and precision ground to keep them factory-fresh for years to come.
2. Triangular bridge type girth construction provides stability needed for heavy duty work. Center section of bed designed in such a manner that chips automatically flow through openings in the rear to chip pan for extra-easy removal.
3. With chip pan set to rear and low work center height, operator can get conveniently near the spindle to change centers, chucks, work pieces and so forth.
4. Longer machines equipped with traveling rod supports which are automatically picked up and dropped off by apron.

EXTRA EQUIPMENT—EXTRA PRODUCTION

1. Additional equipment in considerable variety is available for the Series 80 line. Consider, by all means, the advantages of the "Air-Gage Tracer", a means by which thousands of users have reduced costs substantially.
2. Ask for descriptive Booklet 1603 which not only describes the basic machine but the commonly used items of additional equipment and includes full specifications.



THIS TAILSTOCK MEANS BUSINESS

1. Either single speed or two speed range type available with dead or anti-friction center spindle. Sufficient mass, rigidity and spindle size (5-3/4" or 6-1/2" diameter) to support the heaviest of cuts.
2. Work piece expansion, due to heat, absorbed by heavy duty springs in tailstock.
3. Handwheel located at front for operator convenience when changing work pieces.
4. Movement along bed manually or by power. This combination satisfies all turning conditions.

COMPLETE AUTOMATIC LUBRICATION

1. Headstock, end gearing and gear box served by single system of the filtered, combination mist-splash type.
2. Apron lubrication system of the circulated, metered and filtered type also provides oil to carriage guide ways and cross slide bearings. There is ample lubrication during both power and manual longitudinal and cross feed.
3. Tailstock has its own lubrication system.

MACHINE CONTROL—THE EASY WAY

1. Series 80 controlled by a three-position lever at the apron. A duplicate lever close to the headstock is provided for setup purposes. With this lever, work rotation may be started or stopped and jogging may be accomplished.
2. Shifting, an operation performed many times each day, is at fingertouch ease and speed. Hydraulic power does the work of clutching, braking, gear shifting and jogging.

SUPERVISION IN A JIFFY

1. At a quick glance, supervisor may check (a) work diameter setting, (b) S.F.P.M. setting and (c) H.P. consumption. This makes it possible easily and quickly for him to assure full productiveness of the machine and the operator at all times.

Monarch
TURNING MACHINES
ACCURACY • ECONOMY
LONG LIFE • POWER

FOR A GOOD TURN FASTER . . . TURN TO MONARCH



United States Steel
TRADEMARK



TRADEMARK

Announcing . . . a great name in strapping



Steel Strapping

The former USS Gerrard Steel Strapping Division is now operating as an integral part of the U. S. Steel Supply Division. Gerrard know-how, combined with Supply Division facilities, now make *U. S. Steel* the name to keep your eye on in steel strapping.

And here's what it means to you:

A complete strapping service—strapping, tools,
technical assistance—from 19 service centers!

1. USS Steel Strapping service is now available out of 19 U. S. Steel Supply Division Steel Service Centers. Immediate service no matter where you are located. A complete steel strapping program for everyone . . . strapping, strapping machines, technical assistance.
2. A greatly expanded field service force—a nationwide staff of strapping specialists *plus* the entire U. S. Steel Supply field organization—is available to meet your strapping needs.

3. A greatly expanded engineering force is now hard at work developing new concepts and producing new powerized equipment to lower strapping costs.
4. Order steel strapping—Round or Heavy-Duty Flat—from any one of a *complete* nationwide network of Strapping Service Centers, and it will be shipped to your branch plants from the *nearest* U. S. Steel Service Center.

Lower Strapping Costs . . . with new powerized equipment!

1959 is the big year for you—the year when you'll see more new ways to cut your strapping costs than ever before. They're coming soon. You can use them soon. And 1959

is only the beginning . . . the "kick-off" year in a big new program by the great name in strapping—U. S. Steel.

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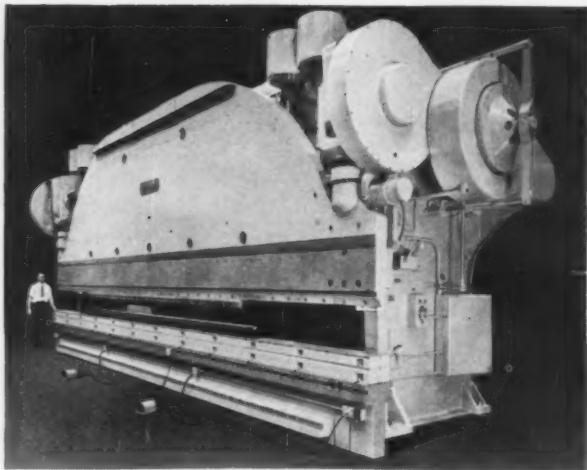


U. S. Steel Supply
Division of



United States Steel

Formerly Gerrard Steel Strapping Department



How Cincinnati® Press Brake construction lowers job costs

Only accurate machines can make accurate bends. The accuracy obtainable from a press brake begins with its structural rigidity. Cincinnati® Press Brakes give you maximum accuracy and rigidity because of these construction features:

1. Interlocked construction—The bed is supported directly by the housings, by means of hand-scraped bearing shoes. No welds are used as load supports, so every Cincinnati is free from welding strains.

2. Center line loading—Since the Pitmans which drive the ram straddle the housings, weaving of the frame and cramping of the ram slides and shaft bearings is eliminated. All operating forces are contained within the housings.

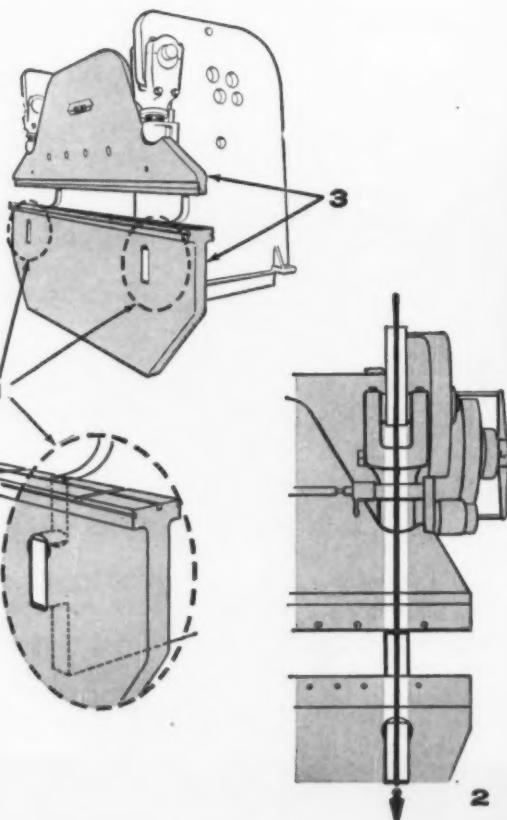
3. Deep beds and rams—It's a simple engineering fact that the rigidity of a press brake's ram and bed increases approximately as the cube of the depth. For this reason, most of the weight of the ram and bed of a Cincinnati® Press Brake is disposed in depth, rather than thickness. Tests prove their working surfaces remain parallel within .005" under capacity loads.

To you these construction features mean money saved in the long run. A Cincinnati® Press Brake is more accurate than other makes when you buy it . . . and will stay that way throughout its long life.

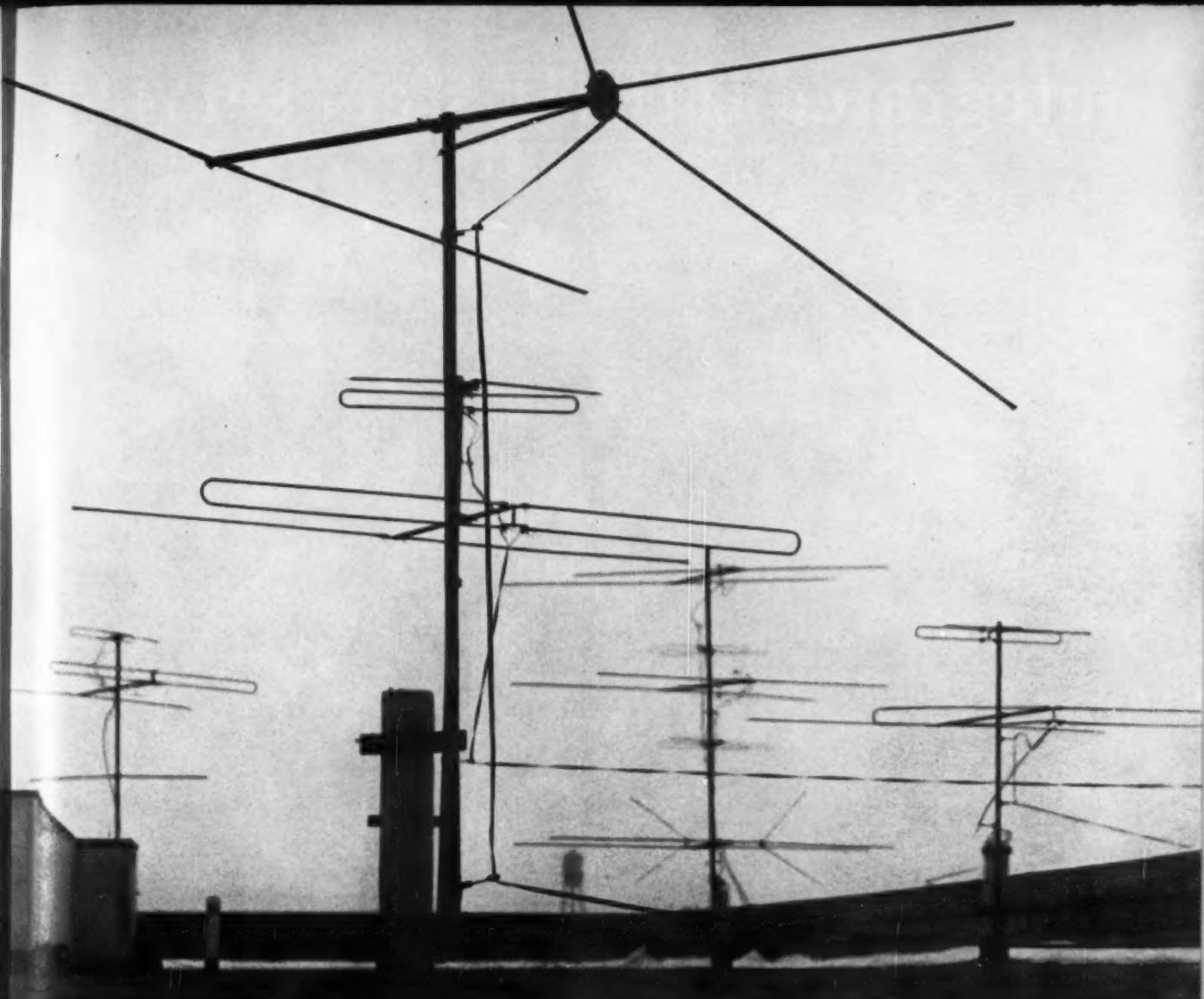
Write Department B for Catalog B-5.

Shapers / Shears / Press Brakes

**THE CINCINNATI
SHAPER CO.**



Cincinnati 11, Ohio, U.S.A.



WHICH ONES WILL LAST (and last, and last!)?
THOSE MADE OF WEIRKOTE® ZINC-COATED STEEL!

Steel tubing that's protected against corrosion even under the most trying circumstances.
Steel tubing that's easily fabricated to meet the most exacting specifications.

That's what you get in tubing made of Weirkote zinc-coated steel!

Weirkote's zinc coating—applied by the continuous process throughout, and so uniformly that every square inch is protected—is skin-tight. There's absolutely no flaking or peeling no matter how tortuous the crimping, twisting or other stresses of fabrication. In fact, Weirkote can be worked to the very limits of the steel itself.

The use of Weirkote can eliminate the need for any further coating process after fabrication. Its tight zinc coating is completely intact and remains so during fabrication and on the job. Weirkote zinc-coated steel tubing is particularly suited for jobs where weather is a factor to be taken into consideration.

Take a good long look at the possibilities and advantages of using Weirkote zinc-coated steel to meet your tubing requirements. For the complete story on Weirkote and how it can help you, write Weirton Steel Company, Weirton, West Virginia.



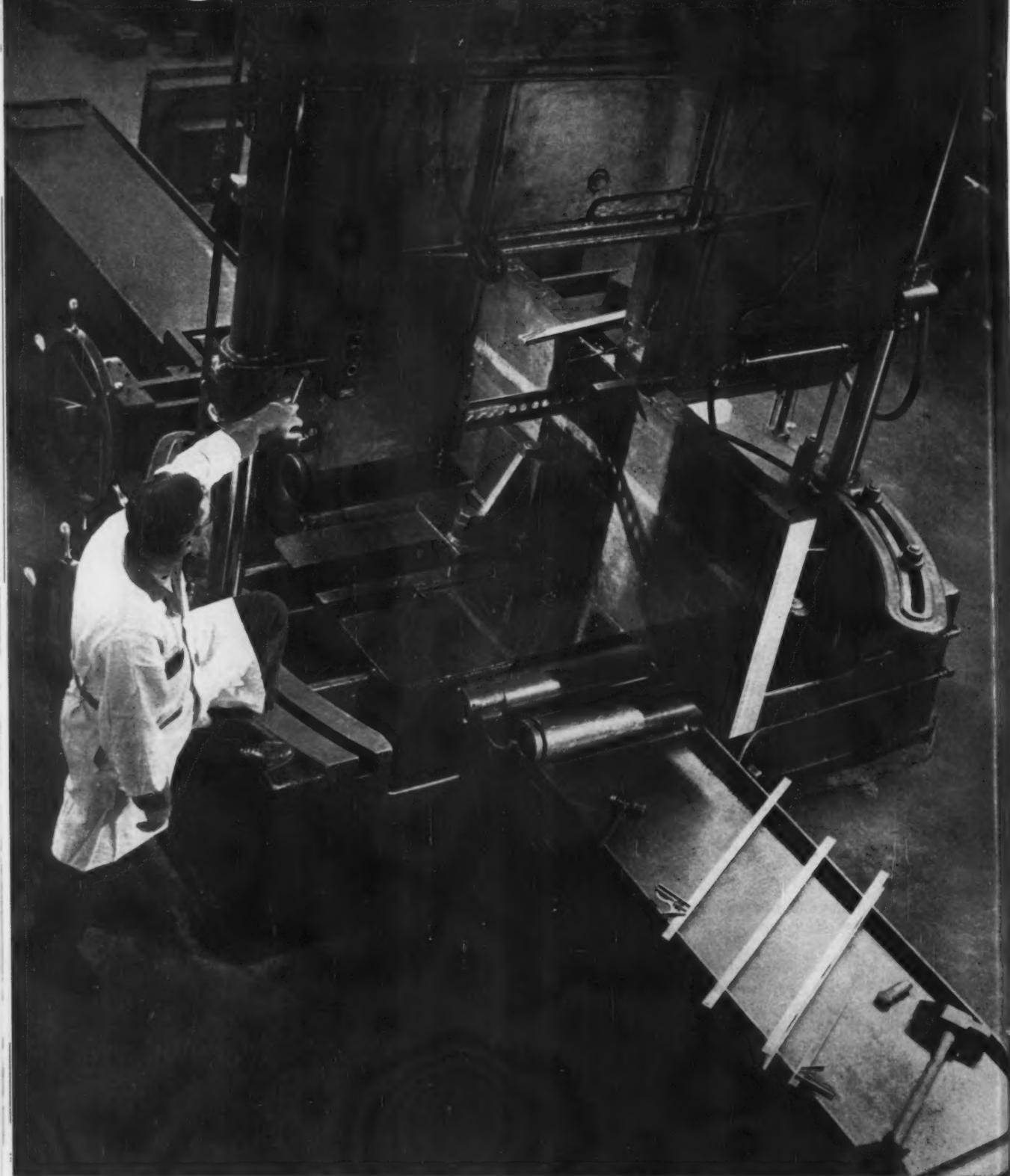
**WEIRTON STEEL
COMPANY**

WEIRTON, WEST VIRGINIA

a division of

NATIONAL STEEL CORPORATION

integrated CRUCIBLE steel service



The customer needed plastic mold steel cut to his specs as fast as he could get it. The Crucible warehouse confirmed his order, gave him immediate deliv-

ery because it had both the steel and the saw (big 24" x 42" hacksaws which can slice a 40" block in 4-1/2 hours).

maintains a variety of local facilities for handling customers' special requirements

"We regularly rely on the Crucible warehouse's equipment. Why, it would take us all day to cut steels they can cut in minutes. We've tried to do these cutting jobs ourselves and, frankly, we lose money nearly every time."

This purchasing agent's words are probably typical because countless companies, all over the country, rely on the 31 local Crucible warehouses for handling their special needs. Unusual cutting of specialty steel grades and sizes is just an example. Or, if a warehouse can't handle extras, such as forging, grinding, machining, boring, polishing, etc. itself, it arranges to have them done conveniently and economically outside.

It's entirely possible that your plant has these facilities. Even so, it can pay you to find out what the local Crucible warehouse has to offer. As one materials buyer put it:

"We have a 'get to know the suppliers' policy. I've visited the Crucible warehouse personally and made a list of its equipment. Here it is—under 'Suppliers' Facilities.' Two weeks ago, when all our saws were tied up, we had the Crucible warehouse cut the steels. They did it immediately, so my list paid off."

All Crucible warehouses maintain stocks, services and facilities to serve you. If you'd like to know more about them, phone or visit the warehouse nearest you — *any time*. Its facilities and services are part of Crucible's integrated operation, from ore to mill and warehouse delivery to you. *Crucible Steel Company of America, Dept. PB06, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

STOCK LIST

Keeps you up-to-date on local stocks of specialty steels. Just ask the Crucible salesman to place your name on the regular mailing list.

One Source
For All
These Steels



Customers' Master Files quickly give Inside Account Salesmen details on your receiving schedules and special requirements.



Inside Account Salesmen keep reference sources handy — give you fast breakdowns of analyses, or heat-treating, machining data.



Fleet of trucks and special delivery vehicles maintained at each warehouse ensure prompt, nearby deliveries.



Full stocks of specialty steels enable warehousemen to ready your order for shipment overnight — or earlier.

TOOL STEELS—Water, oil, air hardening, shock resisting, hot work, plastic and die casting steels in all forms, including bars, sheets, plates, drill rod, hollow bars, forgings and flat ground stocks

HIGH SPEED STEELS—Crucible's famous "Rex"® steels: Rex Thrift Finish rounds, hot rolled and cold drawn flats and squares, drill rod, forgings, sheets, plates, and tool bits

STAINLESS STEEL—Bars, sheet, strip, wire, cold heading wire, metalizing wire, plates, angles

FREE MACHINING STEELS—Crucible Max-e!® rounds, hexagons, plates and brake die steel

ALLOY STEELS—bars, billets, strip and sheet

COLD ROLLED CARBON SPRING STEELS

DRILL STEELS—Hollow and solid drill steels

ALUMINUM EXTRUSION DIE STEELS

HOLLOW TOOL STEEL

WELDING AND HARD FACING ROD

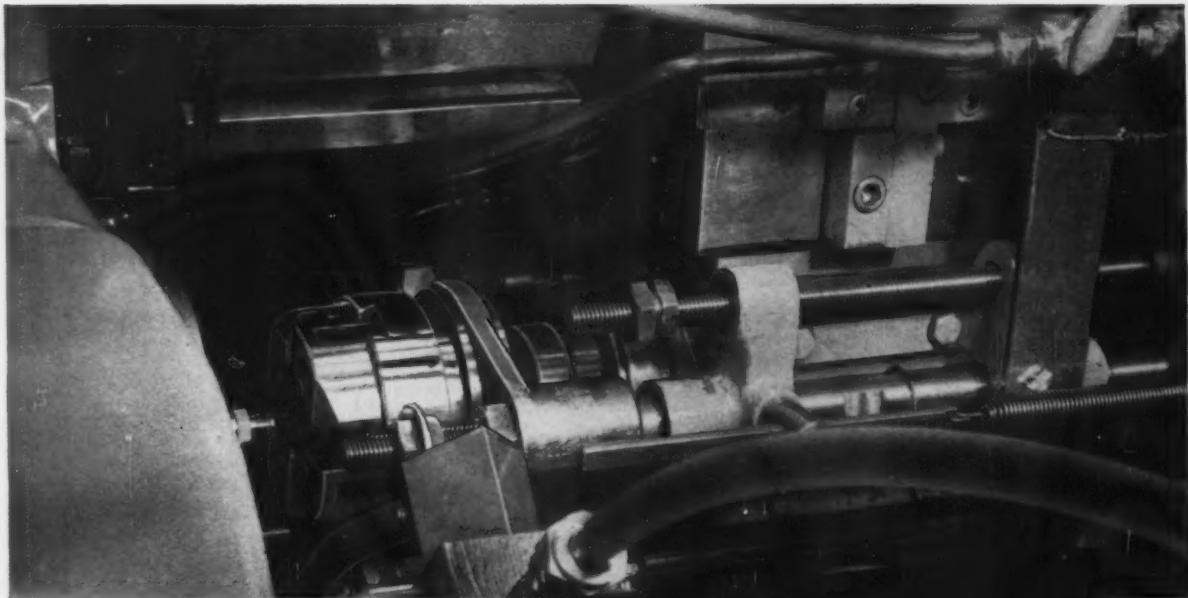
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4500 PIECES
BETWEEN
GRINDS

*... threading stainless
steel on bar automatic*

A LANDEX Hardened and Ground Die Head has maintained exceptional chaser life threading male connector tube fittings at the Crawford Fitting Co., exclusive user of LANDIS Equipment in Cleveland, Ohio.

7/16" 20 pitch UNF threads were cut to Class 3 fit from 316 stainless steel by a 7LLL Head. 144 pieces per hour were threaded 5/16" long within 3/32" of a shoulder at 19 to 20 SFM. 4500 pieces were produced between chaser grinds using 30° short throat chasers.

This outstanding tool life is the result of basic chaser design and over 50 years of LANDIS research and experience in manufacture and hardening. For example, to ensure satisfactory die life, chasers are given special hardening when workpiece design or material specifications so indicate. Long life between grinds is one reason why the use of LANDIS Tangential Chasers ensures threading economy.

Let us show you how to improve threading operations—send specifications and ask for Bulletin F-80.

503

LANDIS Machine COMPANY

WAYNESBORO
PENNSYLVANIA

THE IRON AGE, February 5, 1959

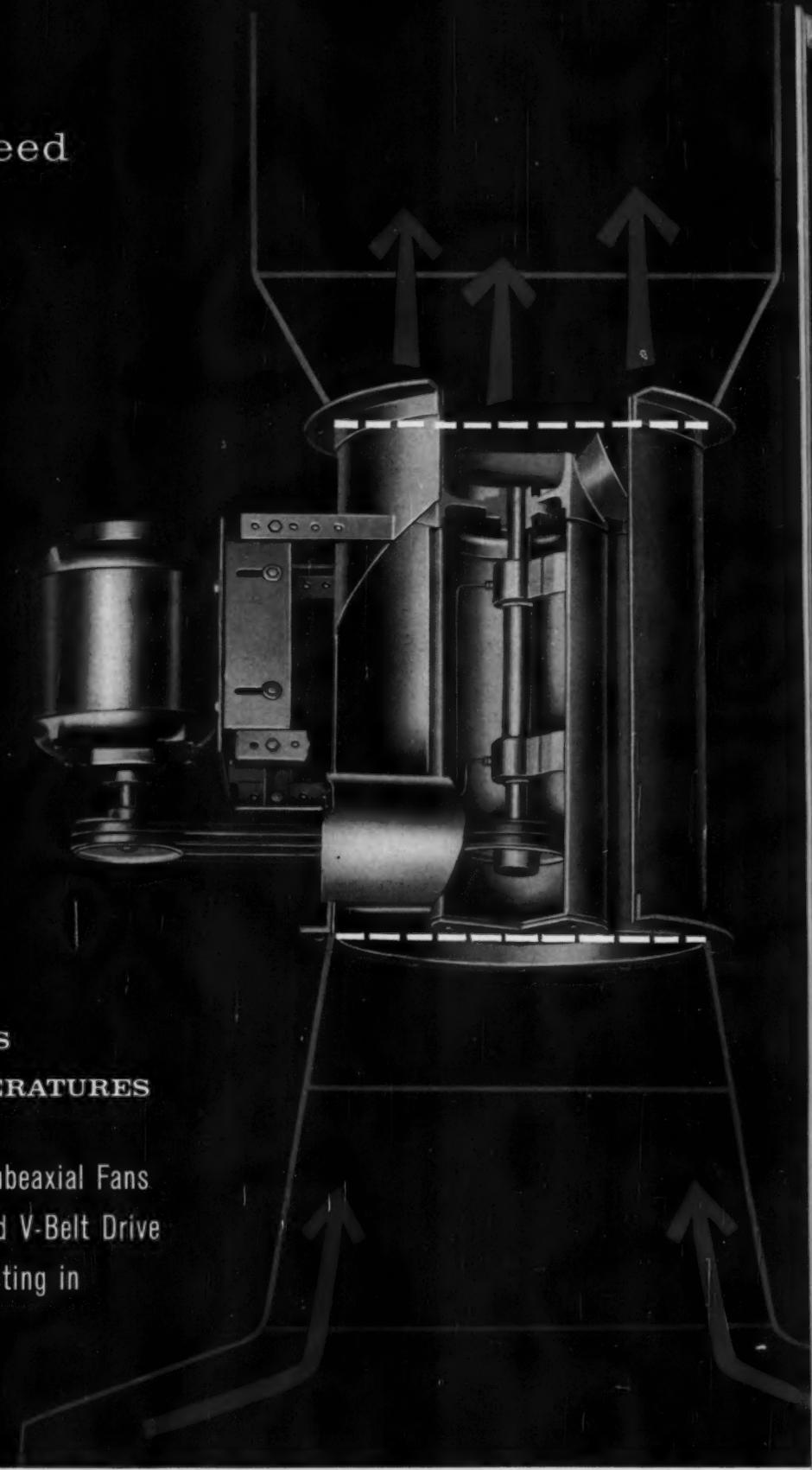
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axial flow fans

for
exhaust
of fumes
and
vapors...

FOR
STANDARD AIR
CORROSIVE GASES
ELEVATED TEMPERATURES

Specify Westinghouse Tubeaxial Fans complete with motor and V-Belt Drive ready for "in-line" mounting in duct or stack



Call your nearest Sturtevant Division Sales Engineer, or write Westinghouse Electric Corporation, Dept. B-2, Hyde Park, Boston, Massachusetts.

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Westinghouse**

FRIDAY

23

JAN. 1959

JANUARY						
S	M	T	W	T	F	S
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

12:00 lunch with Jack

Bring up at Monday meeting -
 Inland Steel Co. now furnishes
 enameling iron in coils -
 should mean -

- ① Inventory Consolidation
- ② lower labor costs
- ③ Continuous operations

comes in widths up to 60"
 16 to 24 gage inclusive - Coils inside
 diam 24" max outside diam 72"
 Coil weights up to 47000 lb.

23-

FRI., JAN. 23, 1959

-342

MARKET-PLANNING DIGEST

WEST COAST AIRCRAFT INDUSTRY is branching out in all directions. The trend is apparent in company announcements of new products: Machine tools, accessories, materials, and services. There's a real push on to search out and court non-military business.

PLASTIC PIPE MAKERS are out for a share of the home market. A research home in Knoxville, Tenn., has all-plastic plumbing, including cold--and hot--water lines, interior and exterior drain pipe. Home was built by National Assn. of Home Builders.

RAILROADS WILL FIGHT against loss of business to the St. Lawrence Seaway this summer. A. E. Bayliss of the New York Central predicts freight rates will be cut to encourage rail shipments to East Coast ports. "The railroad industry does not plan to take the Seaway lying down," says Bayliss.

EARTHMOVING EQUIPMENT MAKERS look for a near-record sales year in '59. An IRON AGE survey shows that many builders are counting on sales of \$2 billion this year. This would be the best since the record-making \$2.4 billion of 1956.

HOME BUILDING CONTRACTS in December were up 29 pct over the year-earlier level, says F. W. Dodge Corp. Non-residential building contracts showed a 7 pct rise, while heavy engineering contracts were up 5 pct.

U. S. POPULATION could hit 210 million by 1968, according to Norman W. Foy, vice president, sales, Republic Steel Corp. And it will take a lot of building to house, clothe, educate, and employ these additional people, adds Mr. Foy. He predicts: "During the next 10 years, 500 to 600 billion dollars worth of goods and services and labor will go into new construction and 200 to 300 billion dollars into maintenance and repair."

CAPITAL SPENDING BY UTILITIES continues high. Edison Electric Institute estimates that privately-owned power companies will bring in 14.4 million kilowatts of new capacity this year. This compares with 14 million last year. American Gas Assn estimates gas companies will spend \$1.7 to \$1.8 billion this year.

POWDER METAL PARTS are finding more uses in automobiles. The Metal Powder Industries Federation believes that about 15 lb of powder metallurgy parts are going into today's cars. One such part, an oil pump rotor, weighs more than 4/5 lb.

STEEL EARNINGS IN '58 reflect the increased efficiency of the industry. More than one company made a good earnings record at operations only slightly above 50 pct of capacity.

RUSSIAN TRADE WARFARE is in for a searching probe by a Senate subcommittee. Sen. Warren Magnuson, Washington Democrat, will head up the investigation. First phase to be looked into will be Russian dumping of aluminum on the world market.



Cleveland's power huge USS heat treat furnace

Handling plates as big as 45 ft. long, 13 ft. wide and 2 in. thick, the approach and delivery tables on this new Drever heat treat furnace require dependable power transmission. That's why Cleveland Worm Gear speed reducers were selected for this job in U. S. Steel's 160-inch plate mill. Behind that dependability stands Cleveland's 46 years of design engineering coupled with workmanship of the highest quality.

In steel mills, mines, fabricators . . . anywhere rugged, compact and dependable speed reducers are needed, you'll find Cleveland handling the toughest assignments. To see how Cleveland's power transmission jobs, ask for Bulletin 145. Write The Cleveland Worm & Gear Company, 3282 East 80th Street, Cleveland 4, Ohio.



Affiliate: The Farval Corporation,
Centralized Systems of Lubrication.
In Canada: Peacock Brothers Limited.

CLEVELAND
Worm Gear
Speed Reducers

Labor "Reform" Law Is Coming But It Will Be Moderate

Labor-oriented Congress will shun anything that would alienate labor votes.

Ike's bill will founder on proposals to outlaw secondary boycotts and blackmail picketing.
—By G. H. Baker.

■ Labor reform, long overdue, now seems certain to be enacted this year on a limited scale.

A pro-labor Congress, sensitively aware of public demand for cleaner unions but anxious to avoid dealing any sharp blows to unions, is gingerly picking its way down the middle road of "moderate" reform.

How Much Is Enough?—Both political parties are well aware of widespread public demand for an end to thievery and other forms of racketeering within unions and in union-management dealings. But the chief question to be settled by the lawmakers is simply this: How much reform is needed?

The probable outcome is a "moderate" reform bill, falling far short of some of the demonstrated needs for a clean-up, but somewhat tougher than the cream-puff reform bill hopefully advanced at the Capitol by union lobbyists.

What Ike Wants — President Eisenhower's proposals to the Congress for labor reform cover a broad area of wrongdoing. Most of the points named by Mr. Eisenhower relate to the need for driving out racketeers and for safeguarding union dues from improper uses.

But Mr. Eisenhower also calls for prohibitions on secondary boy-

cotts and on so-called blackmail (coercive) picketing.

... Brings Labor Complaints—These points (secondary boycotts and blackmail picketing) are sore spots with union officials. A major battle is brewing over whether these items should be included in a labor reform law.

There is ample sworn testimony in the records of the Senate (McClellan) anti-racketeering committee to prove that legislation is needed to end these abuses. But unions are ready to fight tooth and nail to prevent the inclusion of these items in any labor reform bill. And Senator John F. Kennedy, D., Mass., leading Senate Democrat on labor matters, is backing the union position. He says these

proposed bans have "no place" in a labor reform bill at this time.

What Democrats Want — Mr. Kennedy and Sen. Sam J. Ervin, D., N. C., are the co-sponsors of this year's mild "reform" bill. It is closely patterned after last year's Kennedy-Ives bill, which was approved by the Senate but sidetracked in the House.

The Kennedy-Ervin strategy, which is backed by Democratic leaders in both the Senate and the House, is to enact a mild "reform" bill speedily.

... Isn't Enough for Ike—And they are counting on approval of their bill by Mr. Eisenhower. They are betting that his desire for some kind of a clean-union law—even a mild one—will more than offset

Why Ike's Labor Reform Bill Will Have Tough Sledding

Everybody except certain labor leaders agree that stricter control of labor unions is needed. But that's where agreement ends.

Sen. John Kennedy (D., Mass.) and the Eisenhower Administration have introduced bills aimed at correcting abuses uncovered in the Senate anti-racketeering hearings.

The two bills agree on some reform proposals, disagree on others. But the chief difference lies in the Administration proposal to ban secondary boycotts and "blackmail" picketing. That's why Ike's ideas on labor reform are likely to go

down in a union-oriented Congress.

What Ike's bill proposes that Sen. Kennedy's bill does not would forbid unions to:

1. Coerce one employer against doing business with another which happens to be struck by a union; or coerce employees to refuse to handle goods from a struck company.

2. Intimidate the employer into recognizing a union as bargaining representative for his employees in cases where (a) a recognized union already exists, or (b) where a representation election had been held within the previous 12 months.

his annoyance at not achieving the entire reform package asked by the White House.

If this timetable holds up, the Democrats will soon loudly proclaim their "success" in labor reform, and will quietly sidetrack the controversial reform proposals which are so distasteful to union leaders. (The claim will be made that the disputed points are being "studied.")

... But Democrats Have Votes
— Because the Democrats have votes to spare in both the Senate and the House, there is little doubt over the probable success of Mr. Kennedy's mild reform bill. This means that any correction of such flaws as secondary boycotts are to be quietly postponed for an indefinite period.

Outlook: Meaningful labor reform is still a long way off.

Can Ike Hold Wage-Price Line?

You can expect the Eisenhower Administration to do all it can to talk management and labor out of higher prices and higher wages this year. It's part of a determined effort on the part of the White House to take some of the steam out of inflation that's in the making.

But trying to convince businessmen and labor leaders of the need for a "hold-the-line" policy in prices and costs won't be easy.

Government efforts to talk businessmen and labor leaders out of price or wage advances in recent years tend to succeed with management and fail with labor leaders. There are, of course, exceptions. But Washington has found that it's far easier to persuade business to cooperate with plans for achieving government goals than it is to convince labor leaders.

President Eisenhower has named Raymond J. Saulnier, his chief economic adviser, to serve as chairman of the new Cabinet committee to study prices and costs and ways of keeping them stable.



Joseph L. Block



John F. Smith, Jr.

Changes at Inland

■ A major reshuffling of top management executives at Inland Steel Co., has made Joseph L. Block, formerly president and chief executive officer, chairman and chief executive officer of the company.

Mr. Block, who worked in the mill for a year before entering the sales department in 1923, had been president since 1953.

Vice Chairman Elected—Philip D. Block, Jr., senior vice president in charge of raw materials since 1948, has been elected vice chairman.

John F. Smith, Jr., vice president in charge of sales since 1952, has been elected president.

Hjalmar W. Johnson has been elected vice president in charge of planning and research.

Francis M. Rich becomes vice president, steel manufacturing.

Robert M. Buddington was named vice president, sales.

Lemuel B. Hunter was elected vice president—administration.

Carl B. Jacobs was named vice president, raw materials.



Francis M. Rich



R. M. Buddington

Behind New Steel Merger Talks

Pittsburgh Steel and Sharon Steel Are Meeting

Big question is whether the merger would solve existing problems or create more.

Combine would produce ninth largest steel company in the U. S.—By G. J. McManus.

■ Can the whole be greater than the sum of its parts?

Pittsburgh Steel Co. and Sharon Steel Corp. are studying this question now. The two mills are thinking of joining forces. The question they face is whether the merger would leave problems combined but undiminished or whether it would reduce difficulties and promote strength.

What Merger Would Do—If size brings strength, the move makes sense. Combined capacity of 3.3 million ingot tons would make the proposed company about twice the size of either party. Sharon is now rated at 1.8 million tons; Pittsburgh Steel at 1.5 million. Neither is among the 10 largest mills; together they would rank ninth.

The combine would have alloy and stainless products, which Pittsburgh Steel now lacks. It would have facilities for rolling wide sheets, which Sharon now lacks.

What Mills Have Done—Product gaps have been keenly felt by both mills. Pittsburgh Steel has spent over \$110 million since 1950 to modernize itself. Sharon Steel has doubled its electric furnace capacity and beefed up primary rolling facilities.

These efforts have made a difference. By getting away from its old dependence on semifinished sales, Pittsburgh Steel was able to operate above the industry average in last year's slump. In the old days the mill always fell fast and far in a recession.

Pittsburgh Steel buys most of its ore. Result is a higher breakeven point than competitors who have their own ore sources. By itself the mill does not have volume to justify expensive ore development. A union with Sharon Steel, which also buys ore, would produce an iron need that might make mine operation practical.

Profit Margins—The addition of stainless and alloy steels also figures to help. Prices and profit margins are higher in the specialty field.

Sharon Steel makes carbon, alloy, and stainless steels. It is limited to narrow widths in flat-rolled products. It relies heavily on the automotive market. It emphasizes special quality grades.

What Sharon Needs—Sharon's big need has been for finishing capacity and particularly for a wide sheet mill. A 100-ton electric furnace doubled its capacity for melting stainless recently; provision has been made for adding more furnaces in the new shop. A new 44-inch slabbing and blooming mill has paved the way for wide sheet rolling.

But finishing capacity of 100,000 tons a month leaves excess ingots. The surplus now goes into blooms, billets, and slabs when there is a market. Sharon has openly indicated it wants some way of putting steel into wide sheets.

Trend in Stainless—This need has grown more urgent in the stainless field where new equipment is enabling most producers to do a good job of rolling wide sheets. Some stainless men see a trend in mill shipments away from strip and toward sheet.

To join the trend, Sharon needs a hot strip mill and a cold mill. Cost of a complete new hot mill would be something like \$50 million. A cold mill for wide sheets would cost \$10-\$15 million.

Question Marks—There has been speculation in the past that Sharon might get around the expense of a hot mill by having slabs converted by another producer. Pittsburgh Steel may fill a portion of this need.

That would still leave a question as to Sharon's plans for cold rolling stainless sheet.

Bethlehem-Youngstown Give Up

Bethlehem Steel Corp. and Youngstown Sheet & Tube Co. have decided to abandon their plan to merge.

The decision came about a month after Judge Edward Weinfeld of New York's Federal District Court ruled their proposed merger would violate the Clayton Anti-trust Act.

Bethlehem and Youngstown said they had been advised by counsel that an appeal of Judge Weinfeld's decision would not be disposed of

until 1960.

"In view of the desire of both companies to avoid continued uncertainty and to permit individual planning for the future," the companies have ended their agreement to merge.

A. B. Homer, president of Bethlehem, said his company is still looking into the possibility of entering the Midwest steel market. Bethlehem owns a large tract of land in northern Indiana, near Gary.

Efficiency Helped '58 Earnings

But Steel Profits Still Fell Below '57 Levels

A strong fourth quarter aided last year's steel earnings. So did the industry's drive to improve efficiency.

High production rate expected in first half of '59.

■ Operating efficiency helped rescue American steelmakers in a year that was far from good.

That was the story in 1958 as steel earnings fell below the level of the previous year. Among the steel producers in the table below none topped 1957 earnings last year. And that was despite a strong fourth quarter, close to records in some cases.

Facelift Pays Off—Yet even with the leaner look in profits the steel companies found something good in 1958. They saw the industry's drive to modernize and improve facilities pay off when the going was rough.

"It's a great satisfaction," says Republic's chairman Charles M. White, "to report earnings of almost \$4 a share on average operations of only slightly above 50 pct of capacity. This is the direct result of the \$600 million spent in the last eight years to build the most productive furnaces and mills we have ever operated."

Fourth Quarter Aid—Helping boost Jones & Laughlin's fourth quarter earnings 60 pct over the third quarter, according to Avery C. Adams, president and chairman, was "a very substantial increase in plant efficiency."

"Earnings should reflect both the increased volume (of orders) and some of the benefits of new facilities," says Joseph L. Block, chairman of Inland Steel.

What's Ahead—Steel industry leaders are encouraged both by the strong fourth quarter and the cur-

rent swift sales pace.

Roger M. Blough, chairman of U. S. Steel, notes that steel ordering currently "is the heaviest in a year." He predicts his company will operate at 75-80 pct of capacity in the first and second quarters.

"I would not count on too much of a let-down in the third quarter," Mr. Blough says, "assuming all the gates are open."

Arthur B. Homer, Bethlehem Steel president, reports January tonnage orders for his company were the highest in three years. He forecasts Bethlehem operations at 80 pct in the first quarter, 85 pct in the second, adding these estimates may be "too conservative."

What Happened—Here's how the major steelmakers did in 1958:

U. S. Steel—Had fourth quarter profits of \$90.7 million (about equal with the same period in '57) which lifted total 1958 earnings to \$301.3 million. This was below 1957 profits of \$419.4 million.

Bethlehem Steel—Had an excellent fourth quarter (\$57.6 million) topped only by one other final period—the fourth quarter of 1956. Despite this Bethlehem's 1958 earnings were \$137.7 million, down from the \$191 million in '57.

Republic Steel—Had net income of \$61.9 million for the year, as contrasted with \$85 million in 1957. Fourth quarter profits were \$22.8 million.

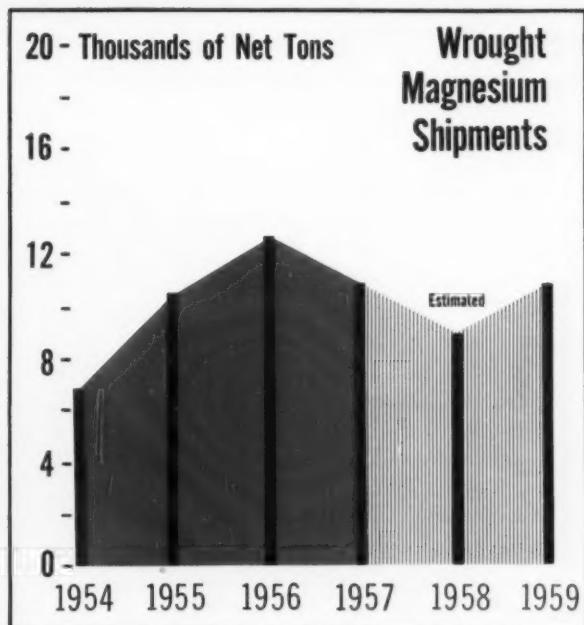
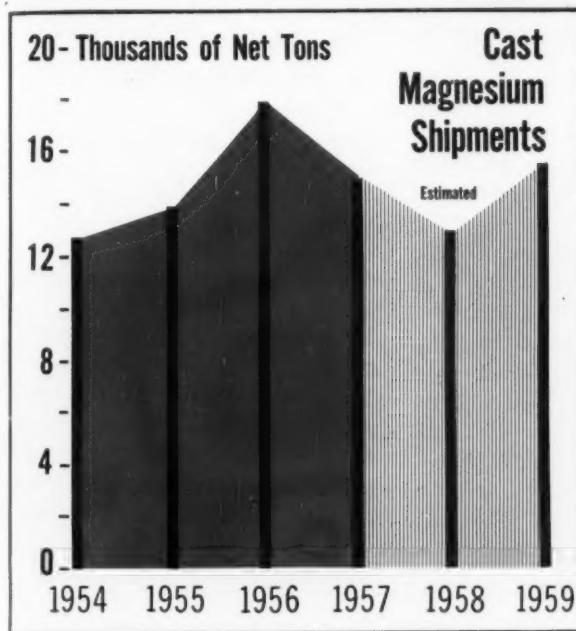
Jones & Laughlin—Registered a 44 pct increase in fourth quarter profits over the same span in '57 with only a 3 pct increase in sales. J&L earnings for 1958 were \$23.1 million, down from the \$45.4 million in '57.

Steel Earnings—1958 versus 1957

COMPANY	1958 Earnings	1957 Earnings	1958 Fourth Quarter
U. S. Steel	\$301,302,643	\$419,406,956	\$ 90,728,989
Bethlehem Steel	137,741,946	191,025,933	57,678,360
Republic Steel	61,921,680	85,014,422	22,842,437
Jones & Laughlin	23,198,000	45,452,000	10,809,000
National Steel	35,827,414	45,518,884	14,605,793
Youngstown Sheet & Tube	21,501,320	42,508,579	10,046,673
Armco	57,233,314	68,297,928	23,399,972
Inland	47,869,042	58,876,875	15,671,302
Wheeling	8,899,000	12,078,000	4,088,000
Pittsburgh Steel	866,000*	4,155,000	959,000
Granite City	9,374,000	9,984,000	3,156,000
Copperweld	2,081,114	2,769,855	1,390,224
Colorado Fuel & Iron	2,147,223	14,236,851	866,788

* Indicates loss.

Picture Brightens for Fabricators



Worst Is Over for Magnesium

Fabricators are all smiles, their feet start finding silver linings. predicting 1959 sales will be up about 20 pct over last year.

But it was tough going for awhile. The recession hit hard.
—By F. J. Starin.

■ Magnesium fabricators are eager to look ahead.

Foundries believe their business will be up about 20 pct this year. They point out this is no mere guess. Casters already have a picture of their first half schedules because much of the work, like moldmaking, must be planned in advance.

And many wrought-products makers insist they will improve even more than the foundries.

Battle Scarred—But even these bright prospects don't seem to erase the pain of the last year or so. Usually when a recession recedes, those who come out on

The nicest thing to be heard among magnesium fabricators about 1958 is that some managed to improve their production techniques.

The magnesium mills insist no one was hit harder by the recession. Most of the companies are small, without funds to plough into market development that wouldn't pay immediate dividends. Many insist they saw the 1958 squeeze coming, but just didn't have the cash to cut it off.

On The Cuff—Also, because the industry is still young, much sample and prototype work must still be done. Most fabricators try to strike a balance between the bread-and-butter jobs that pay the bills, and test samples that rarely break even. During the recession demand for development work picked up, while bread-and-butter business became scarce.

Other strides are just ahead, say

fabricators. For one thing, there is likely to be a rash of stronger new alloys. Mag users say Dow Chemical Co. as the only prime producer has been too vulnerable to monopoly charges, making its whole approach, including alloy development, much too ultra-conservative.

This will change, they believe, because (1) another producer will be making magnesium soon, (2) better alloys are now readily available from foreign sources, and (3) some fabricators have had success with small projects.

Over the Horizon — Foundries predict bigger castings. New techniques would be necessary. But then the Rolle Mfg. Co. had to devise a new four-ladle approach to pour the current record holder—a 4000 lb mag casting.

Better protective coatings are also the goal of more than one company.

Atomic Energy Program Perks Up

The faster pace is evident in the Atomic Energy Commission's 25th Semiannual Report.

Total spending by government and industry last year increased 33 pct.

■ The slow-growing atomic energy industry made noticeable headway in 1958.

During the year, normal uranium for the first time moved in exclusively commercial channels from mines to finished products, the Atomic Energy Commission reports.

Nine new uranium ore mills began operations and the AEC received applications for construction, operation, or export of 26 research and training reactors. Including those newly licensed, 54 research and training reactors were being built, 40 for use in the U. S. and 14 for use abroad.

Civilian Jobs Started—In 1958,

six civilian nuclear power plants were being built, in addition to the power plant for the ship NS Savannah, and two power reactors for export. Six more cooperative industry-government reactors were in various stages of contract negotiations.

While the pace is quickening, atomic energy cannot yet be considered big business. Total commitments by industry and government for work on civilian and military power and propulsion reactors during the year ending June 30, 1959 will be about \$650 million, AEC estimates.

One-Third Increase — About \$250 million of this is for research and development. The remaining \$400 million is earmarked primarily for fabrication and construction of reactor plants. The \$400 million estimate is \$100 million more than was spent in the previous year. Private industry's investment, however, will account for only \$70 mil-

lion of the \$400 million.

Here are some of the major power reactor projects in progress during 1958:

Consolidated Edison Co. plant, Indian Point, N. Y., a pressurized water reactor with capacity of 255,000 net electrical kilowatts. Construction began late in January 1958 and completion is scheduled for 1960.

Yankee Atomic Electric Co. plant, Rowe, Mass., a pressurized water reactor, capacity 110,000 ekw. Construction was about 12 pct complete at the end of 1958.

Commonwealth Edison Co., Chicago, an 180,000 ekw Vallecitos Boiling Water Reactor. This plant, named the Dresden Nuclear Power Station, is being built 40 miles southwest of Chicago, near Joliet, Ill. It was 60 pct complete at the end of 1958.

Fast Breeder Reactor — Power Reactor Development Co.'s 90,000 ekw Enrico Fermi Plant at Lagoon Beach, Mich. The first large-scale "fast breeder reactor," it is scheduled for completion in 1960.

Final design and fabrication of the pressurized water power plant for the NS Savannah, first nuclear-powered merchant ship, continued during 1958. Work is being done by The Babcock & Wilcox Co. Criticality is scheduled for early 1960.

Plowshare Program — AEC reports that during 1958 this study aimed at developing peaceful uses of nuclear explosives brought a number of inquiries from industry and government agencies. Some possible uses:

Loosening and removal of earth and rock for civil engineering jobs; in oil recovery; production of power and isotopes; for mining; scientific uses such as seismology and study of rock characteristics.

New Jobs for Radioisotopes

Many new applications for radioisotopes were developed by industry during 1958. They helped account for a 37 pct increase in radioisotope use during the year. Here are some of the developments:

Radiography—Used to determine correct positioning of critical parts in ammunition fuses; to assure that automotive coils contain the right amount of oil prior to sealing.

Cobalt 60 Gage—Controls automatically thicknesses up to six inches of steel sections in rolling and plate mills.

Portable Backscatter Gage—A more versatile and less expensive gage to measure liquid level in tanks.

Fire Detector—Smoke entering an ionization chamber upsets electrically-charged air, causing an alarm to sound.

Dewpoint Measurement—Apparatus uses cloud chamber principle with a source of ionizing particles to measure moisture content of industrial gases.

Silver Plating Gage—A radium-beryllium source producing neutrons measures thickness of silver plating up to 0.00001-in. accuracy.

Senate Group to Probe Red Trade Warfare

Russian juggling of world markets, by such devices as dumping, is going to get special study in Congress.

A new subcommittee of the Senate Commerce Committee has been created just to keep an eye on the Red world market maneuvers.

First Under Focus—A recent Red move to "break" the world aluminum market will be the first to come under study by the subcommittee, says Sen. Warren Magnuson (D., Wash.), chairman of both the Commerce Committee and the subcommittee.

Magnuson explains the subcommittee will try to determine why the Soviets conduct foreign trade as they do, and generally throw some light on the economic cold war. If the group has any success, it should help U. S. industry and business to anticipate and offset various Russian trade maneuvers.

To Flatten Latins—The subcommittee also plans to dig into a Russian trade offensive now building up to hit at Latin America. International economic experts have warned that any strong Russian bid in South America could be an economic as well as a military threat to this country, the lawmakers point out.

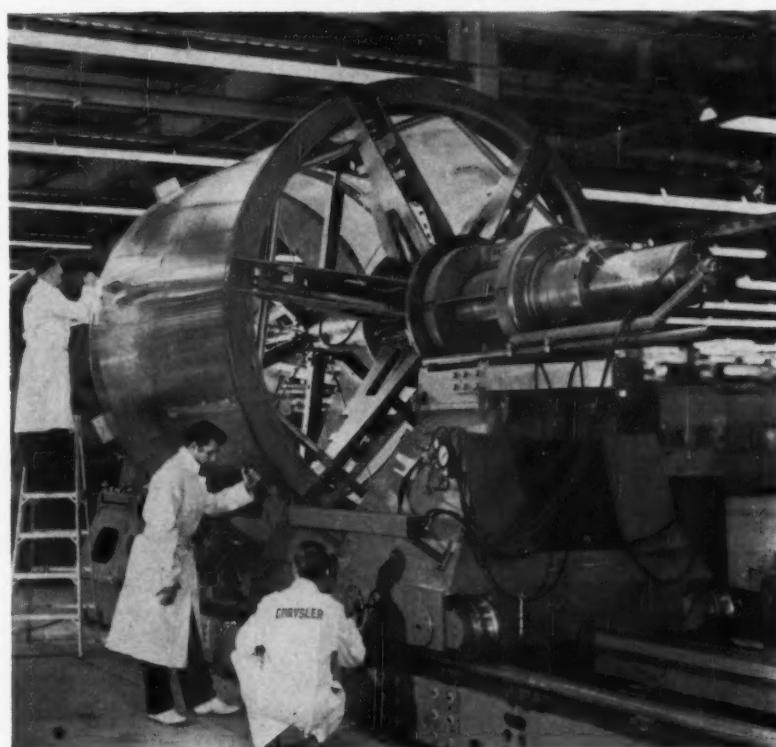
Sen. Magnuson says a Russian speed-up program to teach Spanish can only mean a Soviet intention "to concentrate on capturing the South American markets."

Ike Reminds Unions

The Administration has come out against use of union funds to support state or local political candidates or parties, regardless of how the activities are cloaked.

Labor Secretary James P. Mitchell is warning union leadership that the Corrupt Practices Act forbids unions, as well as corporations, from making contributions to candidates for federal office.

A Step in Making a Missile



TECHNIQUE: Chrysler Corp. has devised a giant welding fixture for fabricating shells for Jupiter ballistic missiles. Work is being done at the U. S.-owned Michigan Ordnance Plant near Detroit.

Union funds, the Secretary insists, should not be spent for political purposes at any level—federal, state, or local—because a member's contributions may be used to help a candidate which he opposes.

Many so-called political educational activities by unions are biased, and should be stopped, he says.

Bill Would Open More Contracts for Bids

More government contracts will be let through bids, under a plan now pending in the House of Representatives.

Rep. Carl Vinson (D., Ga.), the influential chairman of the House Armed Services Committee, has told the Pentagon he'll fight for it. And he'll demand a reduction in the large volume of negotiated contracts now executed by the Army,

Navy, and Air Force.

Sure Thing—Mr. Vinson's views are respected by members of both parties and the military. Hence, his demand for less secrecy in awarding government contracts is likely to result in some corrective action.

The Pentagon awards about five million contracts, worth about \$20 billion, each year. Of these only 275,000 may be bid on. All others are negotiated privately between the government and the suppliers it selects. Unless the Pentagon decides to cut you in on the deal, you're in the dark as to the very existence of these contracts.

Right Arm—Mr. Vinson has named Rep. F. Edward Hebert (D., La.), head of an Armed Services subcommittee to investigate military buying practices and make recommendations for cleaning them up.

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Recent tests conducted on different types of full-finished tubing prove that TRENTWELD® tubing—made by the exclusive *Contour-Weld** process—is smoother than tubing made by any other method of manufacture.

TRENTWELD IS SMOOTHER THAN SEAMLESS. The walls of welded tubing generally are smoother than the walls of seamless because welded tubing is formed from uniformly rolled strip steel whereas seamless is extruded from a billet. *The tests confirm this point of difference.*

TRENTWELD IS SMOOTHER THAN OTHER WELDED TUBING. These tests also confirm that TRENTWELD tubing is smoother than any other welded type thanks to *Contour-Welding**, the welding process patented by Trent that virtually eliminates the weld bead.

WHY SURFACE SMOOTHNESS IS SO IMPORTANT. In still other tests, it has been proved that surface smoothness directly affects *fatigue life*—critical in hydraulic and other pressure applications . . . *corrosion resistance*—vital in strong chemical environments . . . *particle incrustation*—which must be eliminated to prevent product contamination.

So, next time you need stainless or high alloy tubing, be sure you specify TRENTWELD. It's also available in titanium, zirconium, Zircalloy and Hastelloy, in sizes from $\frac{1}{8}$ to 40 in. Meanwhile, why not get full details. Send today for the free, 50-page Trent Tubing Manual. Write: Trent Tube Company, Box 2518, Pittsburgh, Pa.



greater corrosion resistance



less product incrustation



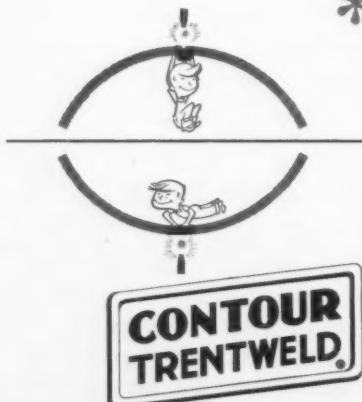
WHAT CONTOUR-WELDING IS

In conventional welding of tubes, gravity pulls molten metal down to form a bead that is difficult to remove by cold working. And cold working may lead to undercuts, focal points for fatigue cracks and corrosive attacks. Cleaning becomes difficult.

With *Contour-Welding* the tube is welded at the bottom. Gravity still pulls the molten metal down, but now the weld area corresponds to the contour of the tube. There's virtually no weld bulge on the inside surface. And even on the O.D., the weld seam more closely conforms to the contour of the tubing.

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William A. Romain

Young Man With a Row to Hoe

Sherman Products president, W. A. Romain, isn't forgetting how tough it was to get a break.

He spends much of his time encouraging young people in technical occupations.

■ William A. Romain got his start working for Henry Ford—not in his auto plant but in his cornfield.

It was tough for an 18-year-old to find a job in 1935, and young Bill Romain had to muster all the resourcefulness he could to land one.

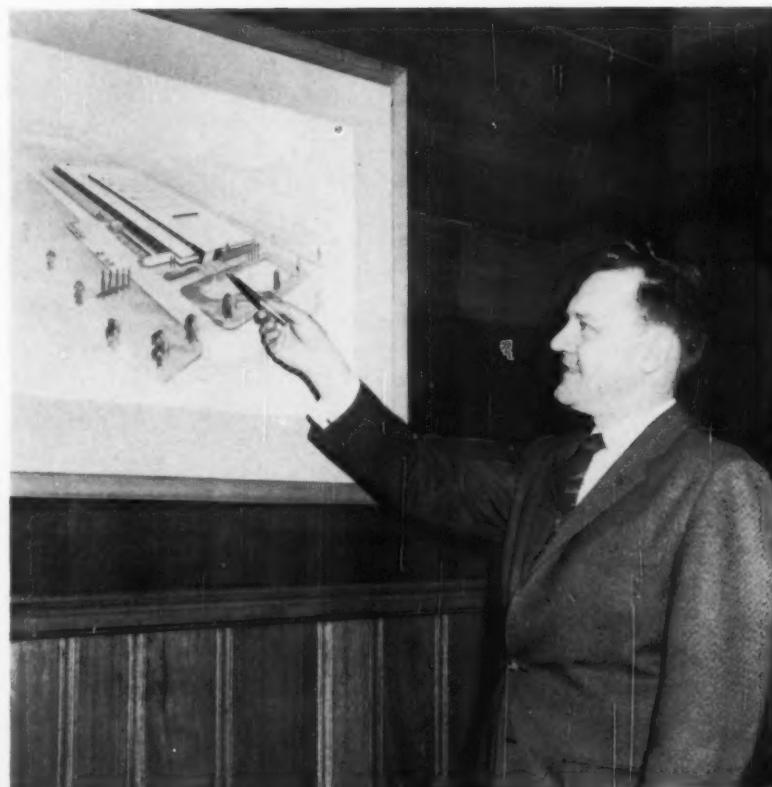
He appraised the job market in his home town, Detroit, and concluded that "Ford Motor Co. was the only place to make money." So he took a letter of introduction—written by himself to get past the gate guards—to Ford's main office.

His Scheme Worked—He was one of 60 young men assigned to work at Camp Legion, a Ford project created to prove that farmers were rugged individualists who did not need federal aid. Bill Romain was more ruggedly individual than most.

Assigned to a gang to hoe a row of corn, he finished his half-mile row in less than half the time taken by others. The camp manager took note and later Bill was named assistant manager of the produce department.

Another Step Forward—Afterward, he entered Ford training school. Projects here took him into every corner of the Giant Rouge plant. He asked many questions and learned many things.

Next, he was assigned to the Michigan Dealers Dept. where his job was to type labels for auto parts



W. A. ROMAIN: Youthful management can do a big job.

shipments. He typed so fast that he soon completed the original job and piled up a huge surplus. Such was the nature of the boy. He was hard-working, conscientious, and ambitious.

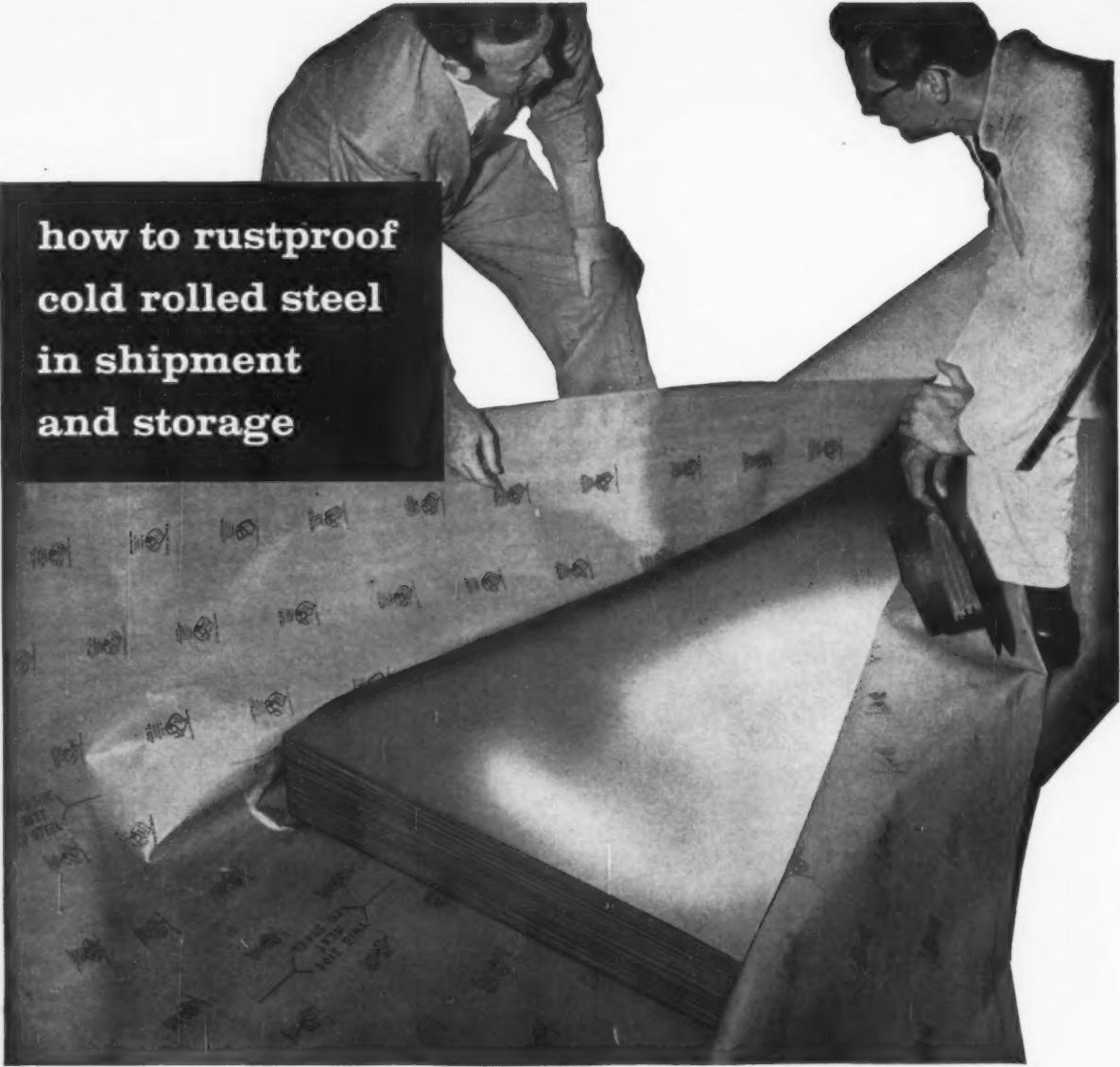
The Turning Point—One day he was called into the office of Harold Sorensen, then head of manufacturing for Ford, and introduced to George Sherman. Mr. Sherman was vice president of Ferguson Manufacturing Corp., an independent firm for distribution of Ford tractors. He needed a secretary, and Bill Romain was given the job.

Quick Climb—World War II and a hitch in the Seabees interrupted his budding business career,

but not seriously. He was discharged just in time to join Mr. Sherman in a new venture, Sherman Products Inc., which was to produce a step-up tractor transmission. Bill Romain was named secretary of the company and a director. After Mr. Sherman's death in 1954, he was elected president.

Since then, the company has expanded its lines and increased sales of tractor equipment to an impressive annual total of \$8 million.

Now 41, Bill Romain devotes considerable time to youth—his future engineers and technicians. He wants American kids to know and appreciate our free enterprise system—even if it means starting in a cornfield.



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Why Company Budgets Stay Tight

Few companies retained much cash after last year's recession.

Now, there's a danger in carrying economy too far. There's a point where streamlining stops and weakness develops.

■ In spite of the encouraging business outlook, money probably will stay tight around your company this year. This means in salaries, budgets, and general spending.

It will be a big factor behind the lag in capital spending. Many companies are now looking over their capital programs in view of improved business. But the corporate purse strings are likely to remain tight for anything outside of necessary operating expenses.

Reasons Why — There are two reasons: First, it's a state of mind holding over from last year's recession. Second, profits retained last year were small. This not only contributes to the conservative attitude, but means that ready cash is hard to get.

While corporate profits were heading for the bottom last year, dividend payments remained high. Most companies did their absolute best to keep dividend payments up, even though not justified, in many cases, by current earnings.

Little Cash Retained — The result was a low level of undistributed profits. The rate early in 1958 was only about one-third of the previous year in terms of profits retained by the company. Hard-hit metalworking probably fared worse than most.

For example, the annual rate of corporate profits after taxes dropped from \$23.1 billion in the first quarter 1957 to \$15.5 for the same period of 1958.

During that interval, dividend payments continued at around \$12.5 billion annual rate. Obviously, this was at the expense of undistributed profits.

Faded Away — These faded away from \$9.4 billion for all of 1957 to about \$3.15 billion annual rate for the first half of 1958. There was a strong recovery late in the year, but not enough to wipe out the tremendous drop. 1958 will probably show the lowest level of retained profits in more than 10 years.

That's why money will tend to stay tight. Not only is the psychological climate cool to spending, but the money may not be there in spite of the hopes for good earnings this year.

You can expect the attitude toward spending to thaw later on this year as business continues to improve. But it will take a lot of talking to get added funds out of most financial committees this year.

Emphasis for some months will be on trimming, not expanding.

... But It Can Go Too Far

There is a danger in carrying this corporate penny-watching too far.

Although there is not too much evidence in terms of specific orders, makers of capital goods are receiving more inquiries. Plans for new plants are being dusted off.

Makers of industrial equipment of all kinds report good fourth quarters and are optimistic of better things ahead.

Diminishing Returns — Too much economy can hurt in several ways. For one thing, increasing efficiency can reach the point of diminishing returns, particularly when business is improving. You can get caught too thin on management, too old on equipment, too slow to react to business change.

Your management would be foolish to throw away the benefits of hard earned efficiency and it probably doesn't intend to. But it has to be ready to move when the time comes.

It's a difficult management decision to make—when to halt retrenching and when to start building, or at least planning, for the

better things to come.

But that time is coming, and faster than you may think. The speed and extent of the recovery have surprised many already.

More Bidding On Defense Contracts?

Your company may have more opportunity to bid on government contracts in the future.

Influential Rep. Carl W. Vinson, chairman of the House Armed Services Committee, indicates he will fight to open up more defense contracts to bidding. At the same time he would demand reduction in the number of negotiated contracts.

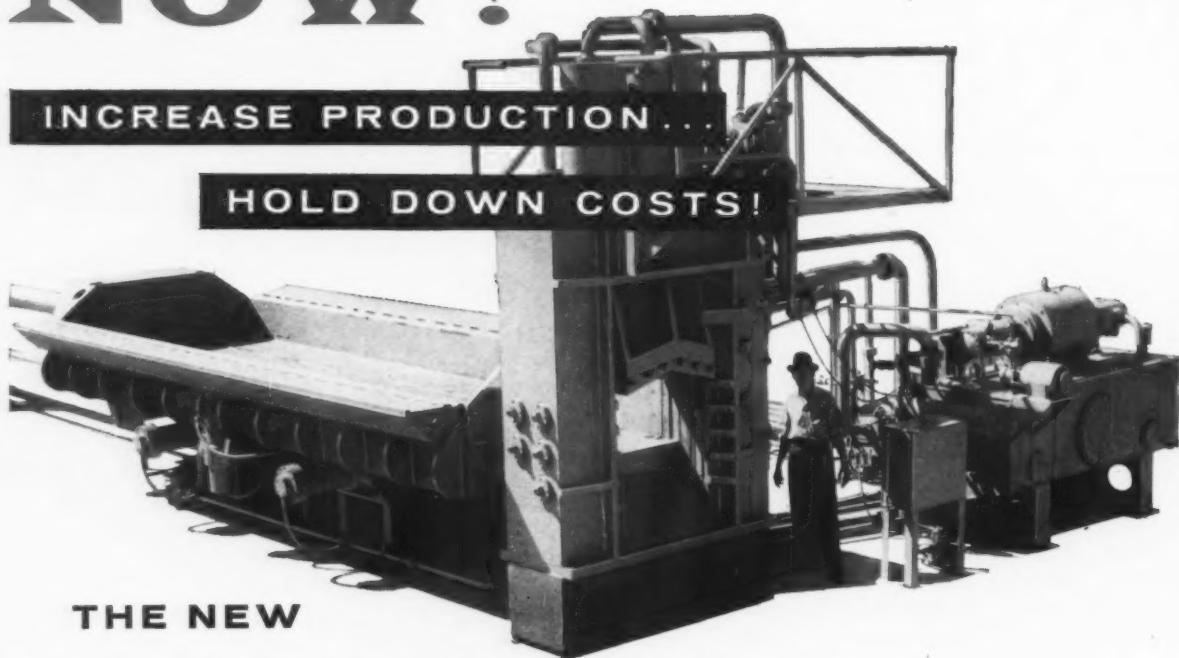
Now, of the five million contracts awarded by the Pentagon, only about 275,000 are up for bids. Others are negotiated privately, and at the government's initiative.

Negotiating has its advantages in many cases, but there is some fear that the Defense Dept. is so preoccupied with technical change that it is losing sight of the importance of a broad base of suppliers.

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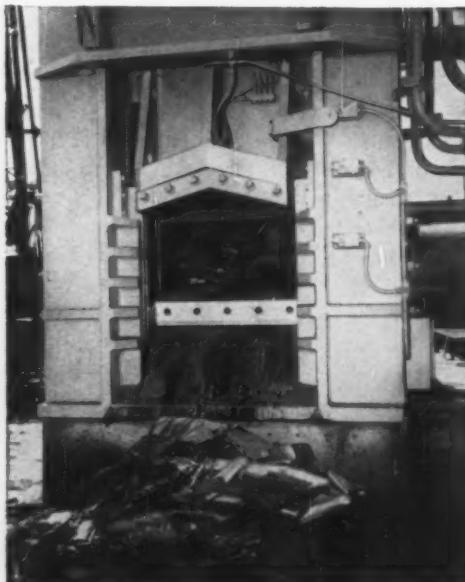
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► *Talk with a Man from Harris*

Strengthen First-Line Supervision To Avert Labor Troubles

By Robert N. McMurry, President, The McMurry Company, Chicago

Weak first line supervision is probably the greatest cause of employee insecurity.

A sound program to weed out inadequate management is the first step to establishing employee loyalty to the company.

Management has long been aware of the growing strength and influence of unions. Recent victories at the polls have underlined this mounting power.

As a result, employers are seeking desperately for some means to offset the political, economic, and industrial force of unions.

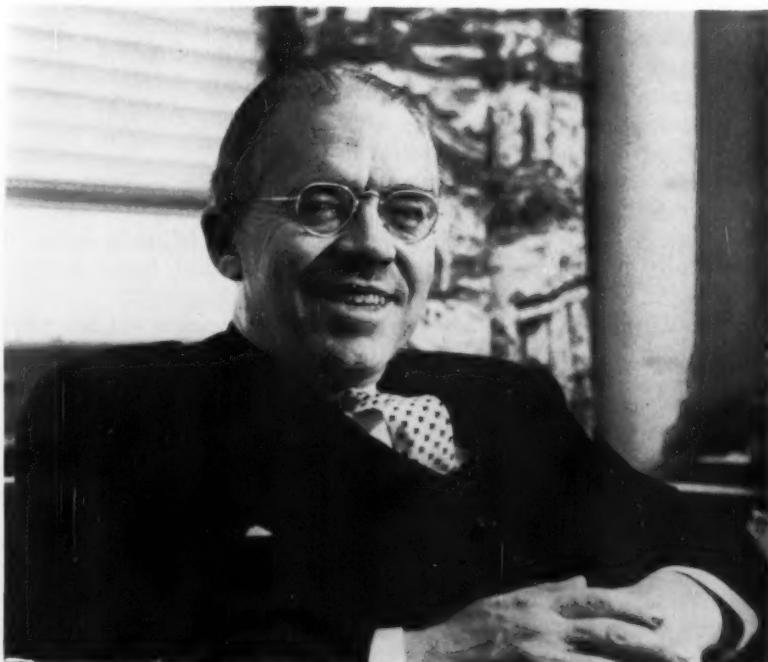
There are steps to take to at least contain this growing power. But it is not always easy to take these steps. They can be painful, and involve a rare sort of courage—moral courage.

Futile Attempts—Many employers have been guilty of two futile approaches to union containment. Many try to "buy" union and employee good will. Others attempt to destroy the union by attacking it. Neither of these approaches is effective. Appeasement never pays; it only indicates weakness and opens the door to new demands or to continuing blackmail. Employee good will can only be earned, never bought.

And nothing strengthens the union more than a direct frontal attack. What better proof, the union member tends to think, that without the union he would be helpless in the face of management?

Why a Union?—The first fact to face is that the typical union member is neither simple and naive, nor is he a noble, selfless idealist. He tends to be an earthy materialist, characterized by great conventionality and insecurity.

Unions exist because they satisfy a felt need on the part of their members. And as long as unions satisfy these needs, they will remain in business. When they fail, members



Dr. Robert N. McMurry

1959's Union-Management Struggle

There is little doubt that 1959 will be a year of union-management crisis. It will probably reach the climax in steel contract negotiations this summer.

To provide continuous coverage of this critical period, The IRON AGE will report labor events in a series of spot news stories and interpretive articles.

For the first of the series, Dr. Robert N. McMurry, prominent consultant in labor relations, has written this provocative analysis of management weakness as a cause of labor unrest.

will repudiate them at once.

Need for Security—Of all the workers' needs, that for security is strongest. And this is one thing management is most loathe to guarantee. In many instances, it cannot do so. This, therefore, is the need which the union principally satisfies.

Generally speaking, weakness in top and intermediate management is responsible for most failures at the bargaining table. But it goes deeper than that.

Weakness of first-line management is the key to most of the dissatisfaction at the worker level which leads employees to feel that they need a union. This is why companies which have chronic labor trouble almost invariably have weak management.

As indicated, the most urgent need of many employees is for security. With weak supervision, they do not feel secure. They feel that such supervision is neither supportive nor trustworthy.

Pattern of Weakness—The weak supervisor usually falls into an undesirable pattern of behavior at the plant. He lacks decisiveness, fails to support subordinates, and otherwise acts in a manner that breeds insecurity.

These characteristics of the weak supervisor are recognizable, and are spelled out in detail in the box on these pages.

When first-line supervision shows these characteristics, morale is almost invariably bad. No one feels secure, often there is little certainty, policies are ambiguous, the future is ill-defined.

Problem Supervisors—If the supervisor who creates anxiety were a rarity, he would present no problem. Unfortunately, in many organizations, especially where promotion is from within and much emphasis is placed upon seniority, many persons of this kind are to be found. They are the problem supervisors and are over their heads on their jobs.

They have been placed where they are because:

They were technically well qualified;

They had given long years of faithful service;

They were loyal and well-identified with their employer;

They were temperamentally compatible with their superiors and were not threats to them;

They were properly meek, subservient and submissive.

Drive Into Unions—Unfortunately, strength, decisiveness, initiative and self-reliance in an employee, while given lip service by management, often make him subject to distrust and suspicion. In consequence, employees with these qualities tend to be passed over when promotions are made. Or they may be asked to leave.

Under such circumstances, stronger, more aggressive and upward striving workers either depart or find an opportunity to make a career for themselves in the union. Being denied access to management, they go up the union ladder.

Negative Selection—The result of this is often a negative selection factor in the choice of supervision: The weak, dependent individuals go into supervision, while the strong, self-reliant, natural leaders either leave or are drawn into the labor movement.

In consequence, the law of "identity with the stronger" often takes effect. Briefly stated, this means that where two rival authority figures function side by side, the allegiance of the workers will be the stronger of the two. If the foreman is the stronger, he will not only dominate the department, but he will have the loyalty of the majority of his people; if the steward is the stronger, the reverse will be the case.

What Creates Loyalty—Contrary to the popular belief, it is not the kind, fatherly laissez-faire supervisor who practices good "human relations" who has his subordinates' loyalty. They may love him, but they will not respect him if he is weak. Weak supervisors are never supportive and they afford no se-

The Pattern



The education of industrial psychologist Robert N. McMurry took him from Chicago's tough back-of-the-yards district through the University of Vienna where he received his Ph.D.

Now, as a prominent, and sometimes controversial, consultant in personnel, industrial relations and market research, he combines his scholarly background with a nonsense, hard-knocks approach.

In typical fashion, Dr. McMurry blames much of labor unrest on inadequate supervision. He pulls no punches when he says:

curity. With such leaders, workers are forced to turn to the union for security, and hence give it their allegiance.

As a general rule, if the primary allegiance of the majority of employees is to the union, it will have the upper hand. But if the allegiance of the majority of the employees is to the company, the power of union leadership to enforce its dictates and make trouble will be reduced.

Steps to Take—Steps can be taken to win and hold the allegiance of the workers. It is easy enough to establish this goal, but to realize it is much more difficult.

This is because it will necessitate not only a careful and objective scrutiny of company practices and policies, but also an impartial inventory and appraisal of company executives and supervisors at every level.

Up and Down Study—The key step in a constructive remedial program is the conduct of an impartial "Up" and "Down" study of the company and conditions as they exist in its plants, offices, labora-

Of Weak First-Line Supervision

The most urgent need of many employees is for security. With weak supervision, they do not feel secure. They feel that such supervision is neither supportive nor trustworthy.

Dr. McMurry says the typical weak superior is likely to:

Be reluctant to back up and support his subordinates, even when they are clearly in the right.

Refuse to accept responsibility for his own mistakes.

Take a two-faced attitude toward his subordinates, praising them to their faces, but criticizing them behind their backs.

Have pets and favorites — He

needs their support.

Make promises he does not keep.

Be indecisive and evasive when asked even a simple question.

Seek scapegoats for his mistakes among his subordinates.

Be a petty tyrant and martinet—pompous, empty, and authoritative.

Be obsequious and synchophantic to his superiors.

Show inconsistencies in his interpretation of company policies.

Make it clear that he has no interest in or respect for his subordinates. He disciplines them in public, rebukes them unfairly, uses sarcasm talking with them.

Never praise, always criticize his men to inflate his own ego.

Discourage creative thinking and suggestions.

Become frightened and disorganized in emergencies.

Be resentful of criticism or even of constructive suggestions.

Keep his subordinates uninformed about company plans and projects.

Operate a planless, disorganized, disorderly department.

Never let the employee really know where he stands.

When first line supervision shows these characteristics, morale is almost invariably bad. No one feels secure; often there is little certainty or structure; policies are ambiguous, the future is ill-defined.

tories and everywhere employees are found who are or might become members of a labor organization.

The "Up" part is an employee opinion poll, followed by personal interviews with about 10 pct of those polled. Those interviewed should be nominated by the workers themselves as the ones best qualified to discuss their associates' needs and problems. In this manner, contact is established with the natural leaders, the determiners of what their fellows think.

What It Shows — These interviews, taken with questionnaire findings, give a comprehensive picture of depth of:

1. The areas of good and poor morale in the work group.

2. The true sources of employee dissatisfaction, as distinct from the stated ones and those advanced by the unions for political or bargaining purposes.

3. The competence of supervision and management as seen from below, from the workers' perspective.

"Down" Program — The "Down"

portion should consist of a careful inventory and appraisal of each executive and supervisor as seen from above. This provides a double look at each, because in the course of appraising his juniors, each executive also unwittingly reveals a great deal about himself.

This permits top management to ascertain its middle management's technical competence, fundamental personality makeup, inherent capacity for leadership, personality peculiarities, and aberrations.

Results — By matching the findings of the "Up" and "Down" portions of the survey, company executives can then:

1. Ascertain the image of the enterprise as a whole and of each member of supervision as seen by employees individually and as a group.

2. Learn both the real and legitimate as well as the fancied grounds of dissatisfaction held by each segment of the work force.

3. Assess the competence, strength, and overall character of supervision at each level.

4. Determine the extent to which employees' needs are being satisfied in the areas of security and certainty; order, system, structure, and intradepartmental discipline; personal and group recognition.

5. Where employees are organized, determine the needs the union is satisfying; the degree to which the union is needed and accepted; extent of influence on members.

It is possible, using these techniques, to contain the power and influence of the union by shifting allegiance from it to the employer.

Thus, starting at the grass roots level, some control can be exercised over the over-burgeoning economic and political power of the labor movement. At the same time, the employer stands to gain by greater productivity, less feather-bedding, fewer work stoppages and improved morale in general.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

Psychology Is New Design Tool

It Could Aid Engineers in Product Planning

One area where engineering falls short is the field of "subjective measurement."

Some automakers have hopes of getting to the roots of buyer prejudice.—By H. R. Neal.

■ A new language may soon be heard in auto company engineering departments. It will be the language of the research psychologist.

These words and techniques that go with them will be used to answer questions which the language of engineering can't answer. And there are some.

Comfort, for Instance—Take a simple problem like seat comfort. In designing seats it has become a routine matter for engineers to measure such things as deflection of the seat and back under various load conditions, road conditions, and speeds.

But after measuring these things, are seat cushions in Car A more comfortable than those in Car B or C? If they are, how would you compare their relative comfort?

Consumer Is Judge—Generally, seat specifications today are supplied by the designers and engineers. Knowledge of human anatomy determines seat height, shape, and other requirements. And standard engineering practices are used to establish the softness-firmness factors, durability, and a host of other specifications.

Ultimately, however, it is the "average car buyer" who makes the final test. He has to live with the car for 24 payments or so, and if the seats feel uncomfortable, he

may buy another make of car the next time.

Man With Answers—Here's where men like Dr. John Versace, research specialist in human engineering for Chrysler Corp.'s Engineering Div., comes in—bringing with him the language and techniques of the research psychologist.

In reporting at the national meeting of the Society of Automotive Engineers recently, Dr. Versace noted that for years engineers have been successfully using objective measurements in determining such things as horsepower, acceleration, and fuel economy.

Measuring of Prejudice—"Using standardized test conditions and a known and accepted 'yardstick' for measuring, it is a comparatively simple matter to reproduce ratings

of this kind time and again," he said. "But in the less tangible, harder-to-define areas such as comfort, car handling ease, or aesthetic appeal it is very difficult to apply objective measurement techniques. This is because we are dealing with people's individual reactions, opinions and prejudices."

But, he said, "These are the areas where the scientific application of subjective measurement can be of value."

Aids Product Planning—Dr. Versace indicated that further work in the field of psychological measurement can aid in product planning.

"The challenge of those of us in this field is to make subjective measurements more reproducible," he said. "We now have at best a very elastic 'yardstick.' The job is

Gas-Saving Simca Just Off the Boat



NEW SIMCA: Just arrived from France, this new six-passenger Simca Vedette is powered with an 84 hp, V-8 engine and has a 106-in. wheelbase. Handled by Chrysler dealers, it sells for about \$2300.



Sustained operating temperatures up to 400° F, as in guided missiles, are death to inferior electrical insulations and laminates. CDF glass-base laminates of Teflon*—the only laminates of their kind approved by the military—can take this punishment steadily.

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to get the elastic out of it."

Explaining what he meant by "reproducible," Dr. Versace said that generally not even an experienced test driver, much less a group of them, is able to "reproduce" the same rating time and time again.

Two Ways Open—He said there are at least two general approaches in making subjective ratings. One is to use as raters a small group of highly trained experts, such as test drivers. The other is use of a larger test jury of randomly selected persons more typical of the motoring public.

Dr. Versace said the advantage of using a small group of highly-trained experts is that they will be able to make minute distinctions between one design and another that the typical consumer might not even discern. "However," he added, "we do not know to what extent the experts may be using an entirely different standard of judgment than the typical consumer until we actually compare their ratings."

The Bull of the Woods



Many Variables — And, he pointed out, a test driver who tests a car one day for ease of handling can, the next day, climb in the same car—disguised so he won't recognize it—and give it an entirely different rating for the same things he tested the previous day. Even the day of the week and the time of day make a difference in the reports.

He described a recent experiment in which 72 men and women were asked to rate relative comfort of six seat cushions. While the cushions were identically trimmed, each was of different internal design and construction.

The Method—The human engineering specialist said the test was relatively simple, yet the procedure used was actually quite complicated. Essentially, it consisted of selecting a "jury" representing a true cross section of the motoring public.

Then evaluation of the test itself had to take into consideration a number of factors, such as adapta-

Automotive Production

WEEK ENDING	CARS	TRUCKS
Jan. 31, 1959	119,197	24,525
Jan. 24, 1959	126,843	24,475
Feb. 1, 1958	104,359	18,355
Jan. 26, 1958	107,495	18,221
TO DATE 1959	545,286	97,655
TO DATE 1958	489,357	81,802

*Preliminary

Source: Ward's Reports

tion of the testers to the cushions, fatigue as the program progressed, height and weight of the testers. Even the order in which they tested each of the six seats was noted.

"Although there were marked differences of opinion within the "jury," Dr. Versace said, "the mathematical procedures available to modern scientific psychology made it possible to determine average preference for three different cushions, and the relative preference for each."

Ford's Experience—Results of another experiment in consumer reaction were just recently released—this time by Ford Div. of Ford Motor Co. It was the "findings" of Ford's Consumer Panel—400 persons selected by Dr. George Gallup to test-drive 1959 Fords for 30 days.

At the end of the month-long test, according to the report, 84 pct of the panelists said Ford was the "best looking" in its field, 72 pct said it had the most comfortable seats and ride, 63 pct said it had the best-built body, 61 pct thought it cost least to buy.

Interpretation Needed—Actually, just how meaningful these results are is difficult to say. A Ford spokesman was unable to say whether panelists, during their 30-day tests, actually made comparable tests of other cars, or whether they had tested any other cars at all.

But in reply to another question unrelated to the results of the Ford Consumer Panel, Dr. Versace had pointed out the job of the research psychologist isn't to record what the test party said, rather to interpret what he meant.

van huffel

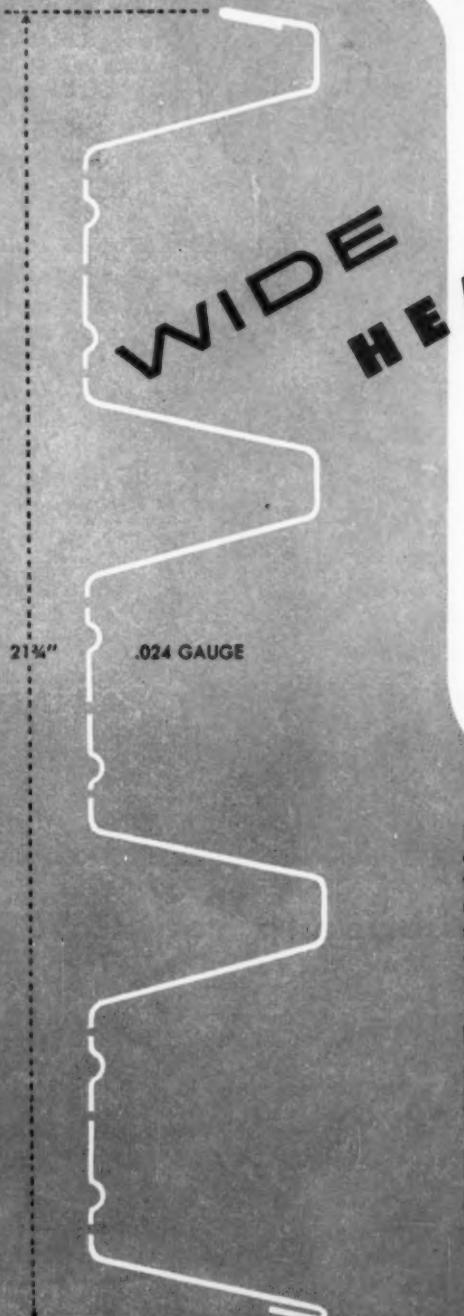
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President Takes Political Reins

Attacks Goad Ike Into a Personal Approach

Members of his own party led the chorus of complaints that Ike was inaccessible.

Some of the blame is being dumped on the departed Sherman Adams.—By G. H. Baker.

■ President Eisenhower, stung by complaints of "no leadership" is finally beginning to show signs of political awareness.

The resurgence of positive action is showing in several ways: A calculated display of energetic and cordial relationships with Republican congressmen; plus some definite signs of renewed vigor in directing White House staff executives.

Don't Call Us . . .—Republican congressmen have squawked ever since Ike became chief executive that they have seldom been assisted by Mr. Eisenhower in their home states and districts or in parliamentary horse trading at the Capitol. What's more—the complaints go on—the President is all but inaccessible to them, in person or on the telephone.

Mr. Eisenhower is a firm believer in the "staff" concept of farming out assignments. He simply doesn't want to be bothered with what he brusquely calls the "details." He likes to keep a clean desk. His Cabinet and his White House aides are therefore reluctant to take up any but the gravest matters of national import with him.

... We'll Call You—This system seems to work well in military organizations. But it does not fit the pattern of practical politics. The belief has been growing among Republican precinct workers that Ike knows nothing of their efforts and

cares less. As a result, such former Eisenhower champions as Rep. Richard Simpson (R., Pa.) are now openly demanding the President show some signs of life in dealing with the rank-and-file of the party.

In the White House executive suite, some staffers say Sherman Adams' (departed assistant to the President) resignation was "the best thing that has happened to Ike as President." Their explanation: Adams regarded himself as an alternate

President. He forcefully (and often rudely) prevented many Republican congressmen and state leaders from consulting with the President.

Blame Sherm—Adams dabbled in Republican patronage matters that traditionally belonged to Republican politicians in Congress and in the State capitols.

Ike now says he is "amazed" that any responsible leader was ever prevented from seeing him.

May Be Killed by Kindness

Too Many Cooks . . .—American areas of economic distress may wind up suffering from an excess of efforts to relieve their plight.

The Administration has a plan, subject to congressional approval, for federal loans and grants to aid ailing communities. But a more expensive scheme, a new bill backed by 34 Democrats and five Republicans, has been unveiled in the Senate. And there are other bills in both the Senate and House for varying amounts of assistance.

. . . Spoil the Broth—With so many ideas for aid to depressed areas, the national price tag could be so high the White House would turn down the proposed law. This happened in 1958, when President Eisenhower rejected S. 3683.

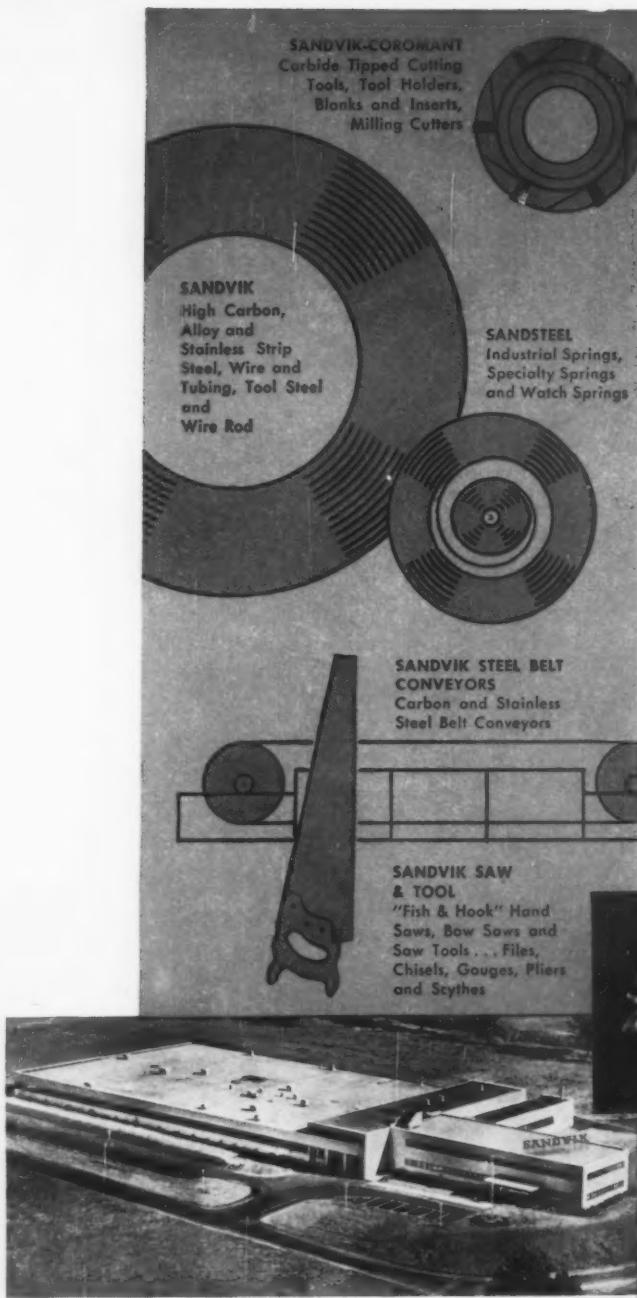
The bill vetoed last year would have spent \$275 million in federal funds to assist urban and rural industries beset by persistent unemployment. Mr. Eisenhower's current view is that Congress should vote \$55 million as a starter, for area assistance.

Big Spender—More ambitious is the proposal in the new Senate bill, S. 722. Introduced by Sen. Douglas (D., Ill.), for himself and 38 colleagues, it calls for a \$375-million program of loans and grants aimed at area redevelopment and the building of facilities to attract new industry.

Its loan section provides two revolving funds of \$100 million each; one for industrial projects, the second for rural redevelopment. Loans would be for 30 years.

A third \$100 million revolving fund would assist states and organizations in buying or developing land. Loans from this fund could run 40 years. The final \$75 million would be a lump-sum appropriation for public-facility-aid grants.

Thrifty Scott—A more modest proposal for area assistance is S. 268 offered by Sen. Hugh Scott (R., Pa.). He recommends a \$200-million program; \$100 million for urban industrial areas, \$50 million for rural areas, and \$50 million for public facilities.



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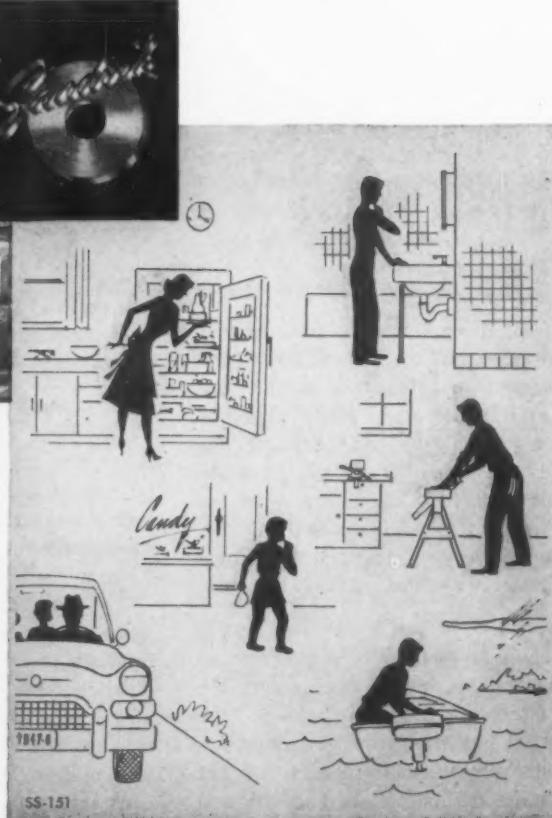
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How Aircraft Makers Diversify

They Spend Time Pushing Industrial Sales

Major aircraft and missile concerns are skilled at widening their sales base.

Now they have a new approach — turning out products for industry.—By R. R. Kay.

More and more products for industry are coming from major West Coast plane and missile-makers.

The aircraft plants are finding marketable products to develop in their own plants. And there's a definite push to search out and cultivate non-military business.

Who's Involved—That goes for Boeing, Convair, Douglas, Hughes, Lockheed, North American, and Northrop. A good many of the larger subcontractors are also interested.

You can see the trend in company announcements on new machine tools, accessories, materials, and services. Here are examples at:

Convair: Dynapak Div., Pomona, Calif., is on the market with a new machine tool. It developed from Convair-made test equipment for aircraft-missile parts. The high-impact, pneumatically-energized machine forges, extrudes, and forms. And it can handle high-strength metals and alloys.

North American Aviation: The Navan unit, a sales and marketing group for inventions, now offers diamond cut-off saws, aluminum alloys, corrosion resistant materials, and collapsible shipping containers. NAA's diverse work ranges from

prefabricating wall panels to erecting a geodesic dome.

Douglas: Aircomb, a lightweight, high-strength material is on the market.

Along with General Aniline and Film Corp.'s Ozalid Div., Douglas formed Datagraphic Systems, Inc. This firm will develop new techniques, processes, and systems in the microfilm and reproduction field.

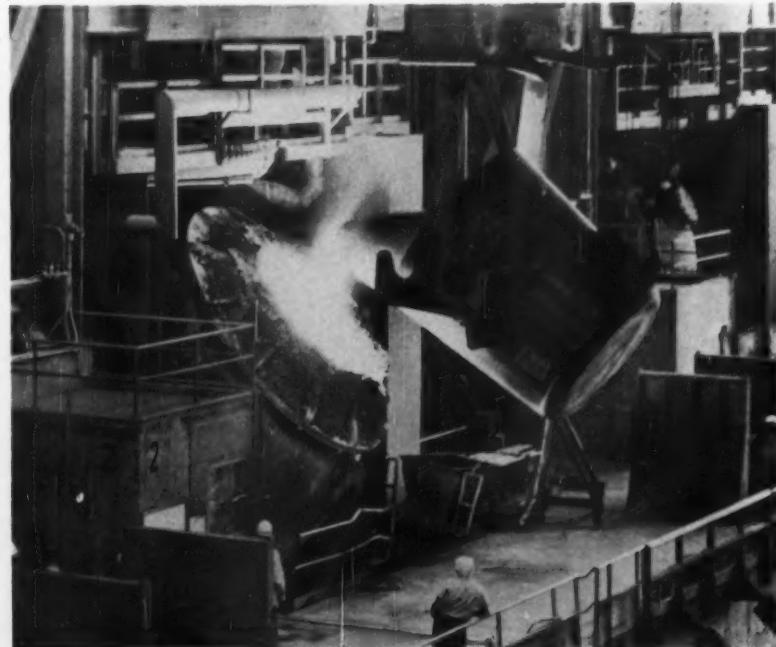
Hughes: It's producing tape-controlled devices for automating machine tools.

Lockheed: The company is making a pitch for its aircraft loading and handling systems and equipment. It feels that this equipment can go into more general use.

Aerojet-General: This manufacturer is working on a newly-designed transfer pump for liquid fluorine.

Diversification is nothing new to the major aircraft firms. For years they've worked to beef up their non-military sales dollar. Much of it came from transport planes. The trend to products for industry is a real switch.

Kaiser Steel Puts Oxygen Furnace to Work

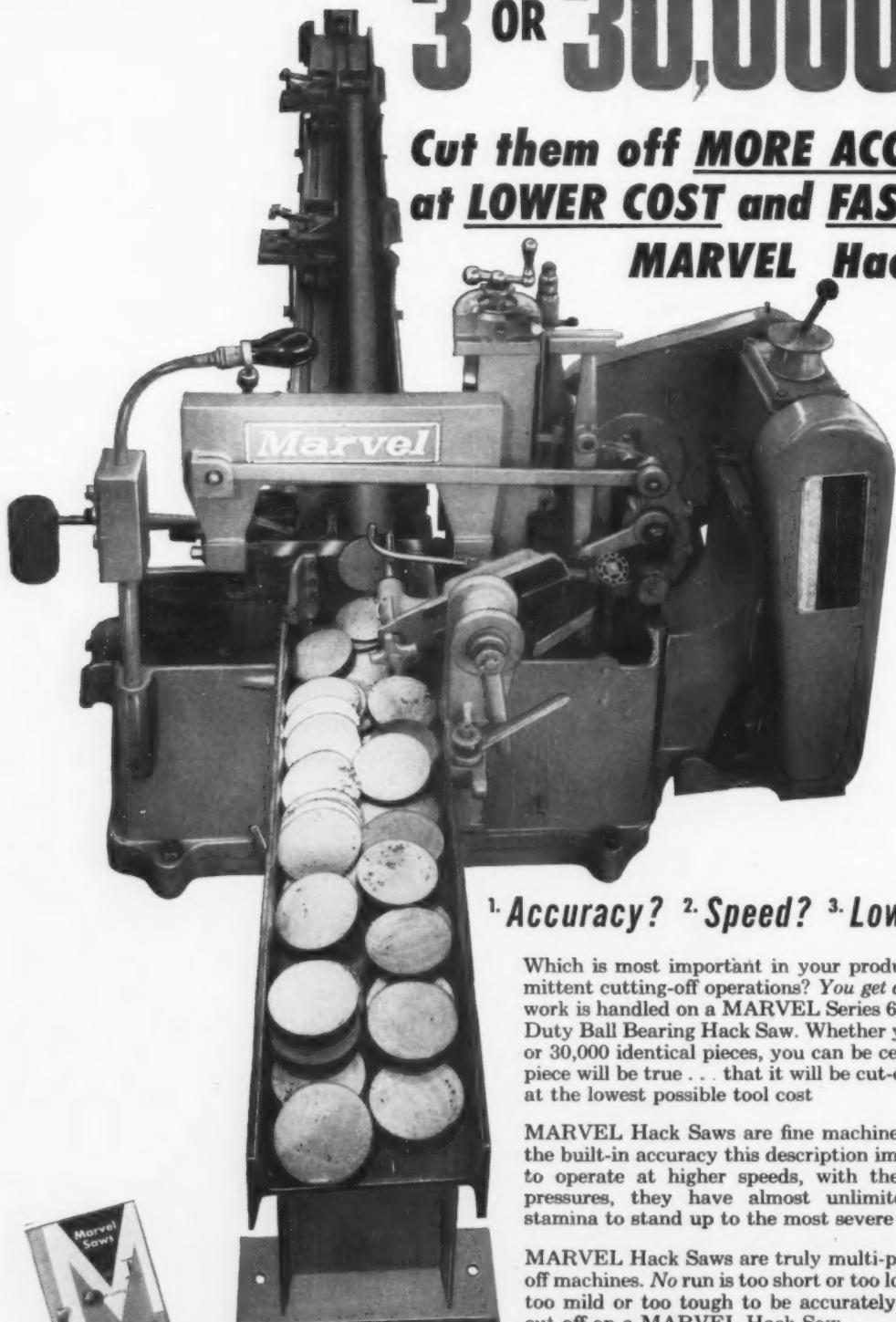


SIXTY MINUTE HEATS: One of three new basic oxygen furnaces at Kaiser Steel's Fontana plant is charged. Kaiser's oxygen steelmaking is last phase of company's completed \$214 million expansion plan.

3 OR 30,000 PIECES

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MARVEL Hack Saws are fine machine tools, with all the built-in accuracy this description implies. Designed to operate at higher speeds, with the heaviest feed pressures, they have almost unlimited power and stamina to stand up to the most severe service.

MARVEL Hack Saws are truly multi-purpose cutting-off machines. No run is too short or too long, no material too mild or too tough to be accurately and efficiently cut-off on a MARVEL Hack Saw.



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New Write-Off Rules Suggested

Builders, Distributors Tell Why Change Is Needed

Government is chided to change its thinking or risk our security program.

The important thing, says the trade, is the economical, not the physical life of a machine.—By E. J. Egan, Jr.

■ The U. S. machine tool industry, still struggling to shake off the recession, grows more concerned every day about the Government's "out-moded" tax-depreciation policies. Quite naturally, the industry has a few suggestions.

Its advice is detailed in a memo prepared after a recent meeting, in Cleveland, of the Government Relations Committees of the National Machine Tool Builders' Assn. and the American Machine Tool Distributors' Assn.

A Matter of Security—Quoting from the memo: "Tax depreciation is important because it is directly connected with modernization and replacement of the country's production base of machine tools. . . . Without the most modern and efficient kind of industrial capacity, we cannot manufacture the planes, ships, missiles and tanks upon which the national security depends. Nor can we achieve the productivity required to combat inflation."

The memo observes, "The Internal Revenue Service has very considerable control over the rate at which U. S. industry replaces and modernizes its productive equipment." New equipment is financed largely from income.

What Industry Wants—The memo delves into tax depreciation

in the U. S., pointing out that Treasury Decision 4442 in 1934, and Bulletin F in 1942, have taught revenue agents to think in terms of equipments' physical life instead of its economically useful life.

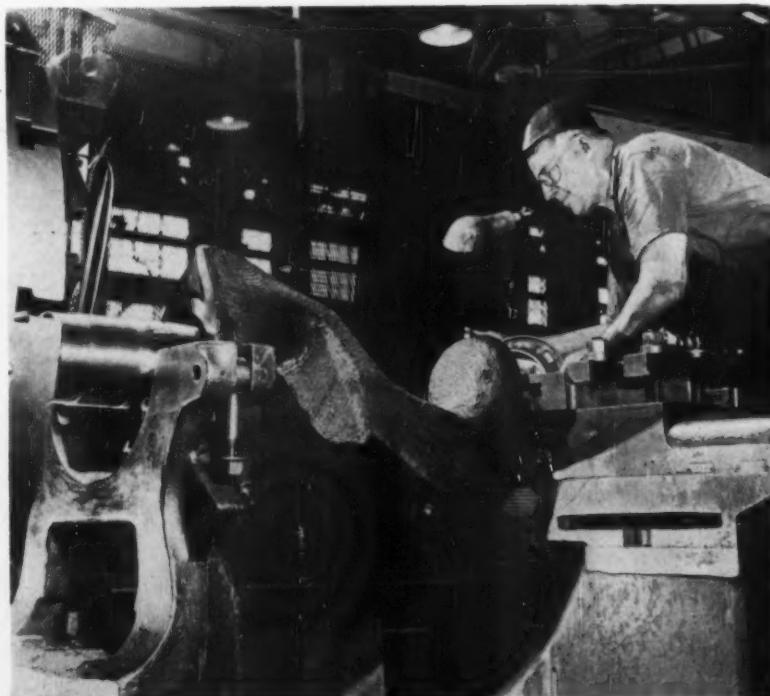
As a first step, the industry wants the Government to junk Bulletin F and the entire concept of useful lives and historical patterns of depreciation. Proposed is a "bracket" or "class-rate" approach to depreciation.

As the memo explains: "This

calls first for the classification of all depreciable property into a relatively few groups or categories. Taxpayers would then be given a range or 'bracket' of lives or rates, or simply an upper limit, which might be applied to assets in each category."

Don't Look Back—The range of lives for each bracket would reflect present-day thinking on technological obsolescence. A minimum of attention would be paid to past patterns of retirements.

Slow and Steady Works Best



SPEED CRITICAL: If the operator gets this engine lathe turning too fast, the workpiece, a tungsten carbide-faced Sigma blade for a special mixer, will vibrate and fly off center, causing a "flywheel" effect. The blade and mixer are being built by Baker Perkins, Inc., Saginaw, Mich.

INDUSTRIAL BRIEFS

Phoenix Changes Name—Phoenix Iron & Steel Co. has changed its corporate name to Phoenix Steel Corp. A subsidiary of Barium Steel Corp., Phoenix is a basic steel producer and operates plants in Phoenixville, Harrisburg, and Chester, Pa. The Phoenix Bridge Co., a subsidiary, will continue operations under its present name.

Merger Plans—Rome Cable Corp. and Aluminum Co. of America have announced plans to affiliate. Alcoa will acquire all properties of Rome Cable for Alcoa common stock. The agreement is contingent upon approval of Rome shareholders, who will meet on March 25.

Reynolds at the Helm—J. Louis Reynolds, executive vice president of Reynolds Metals Co., Richmond, Va., will head the Aluminum Industry Committee to raise funds in support of the nonpartisan Foreign Policy Assn.

Industrial Heaters Elect—Industrial Heating Equipment Assn., elected these new officers at its recent annual meeting: President, R. L. Harper; vice president, W. E. Benninghoff; treasurer, Roy Snyder; executive vice president, R. E. Fleming.



"... Baby overslept!"

On Your Mark—The 1959 Doepler Award, sponsored by the American Die Casting Institute, is open for nominations. The award, consisting of a plaque and cash honorarium of at least \$500, recognizes outstanding contributions to the advancement of die casting. Supporting papers or related material should be submitted before April 15, 1959, to: Award Committee, ADCI, 366 Madison Ave., New York.

Three-Fold Increase—Production facilities for high-purity (ductile) vanadium metal have been expanded by Union Carbide Metals Co., Div. of Union Carbide Corp. To meet the increasing demand for this refractory metal, Union Carbide Metals has tripled the facilities of its Fine Metals & Chemicals Dept., Niagara Falls, N. Y.

Move to Memphis—U. S. Steel Corp.'s U. S. Steel Supply Div. will build a new steel service center at Harbor Ave. and Dock St. on President's Island, Memphis, Tenn. The plant will be operated in conjunction with the supply division's district warehouse in Birmingham, Ala., and is scheduled for completion this year.

Metallurgical Study—A study of the ductile fracture of metals will be made at Illinois Institute of Technology under a grant of \$36,500 from the Air Force Office of Scientific Research. Dr. N. H. Polakowski, professor, metallurgical engineering dept., will direct the program.

Cincinnati Switch—Detroit Steel Corp. has moved its Cincinnati district sales office from 2903 Carew Tower to 524 Maxwell Ave., Cincinnati.

New Standard—A revision of American Standard B27.1—Lock Washers—has been approved by the American Standards Assn. and published by the American Society of Mechanical Engineers. Copies can be obtained from the ASA, 70 E. 45th St., and the ASME, 29 W. 39th St., New York.

Engineers Get More—Engineers' salaries are going up an average of 6½ pct a year. The median salary of engineers in industry, government, and education in '58 ranged from \$6125 annually for engineers with one year of experience to \$11,000 for those with 20 years' experience. The study was made by Engineers Joint Council.

Continuous Casting—One of the principal speakers at the Annual Iron & Steel Conference, sponsored by the Instrument Society of America, will be Harry L. Brien of Atlas Steel Ltd., Welland, Canada. Mr. Brien will discuss development and instrumentation of the Continuous Casting Machine at Atlas. The conference will be held Mar. 11-12 in Pittsburgh.

Gate Moves West—Gate City Steel, Inc., Denver, Colo., has purchased plant facilities at Berkeley, Calif., to house operations of its recently acquired subsidiary, Moffett Engineering, Inc. Gate City Steel has steel fabricating and warehousing plants at Omaha, Nebraska, and Boise, Idaho.

Defense Reserve—Three members of the Institute of Scrap Iron & Steel Inc. have been named to the National Defense Executive Reserve by the Business and Defense Services Administration, U. S. Dept. of Commerce. They are: M. L. Chase, Luria Bros. & Co., Inc., New York; S. M. Kaplan, M. S. Kaplan Co., Chicago; Sidney Grossman, Grossman Iron & Steel Co., Inc., St. Louis.

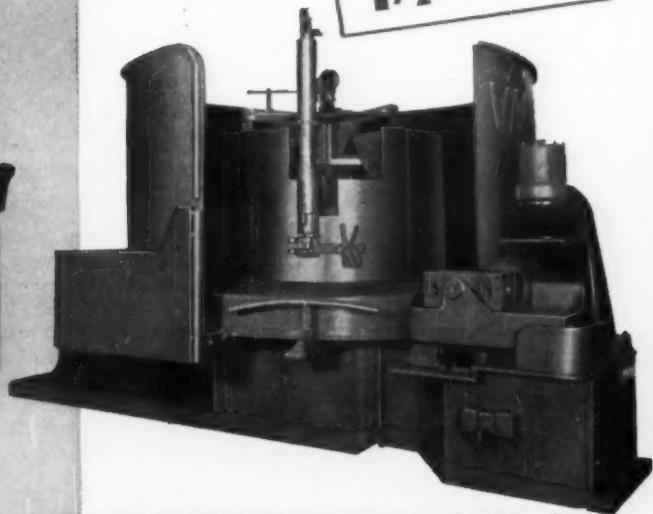
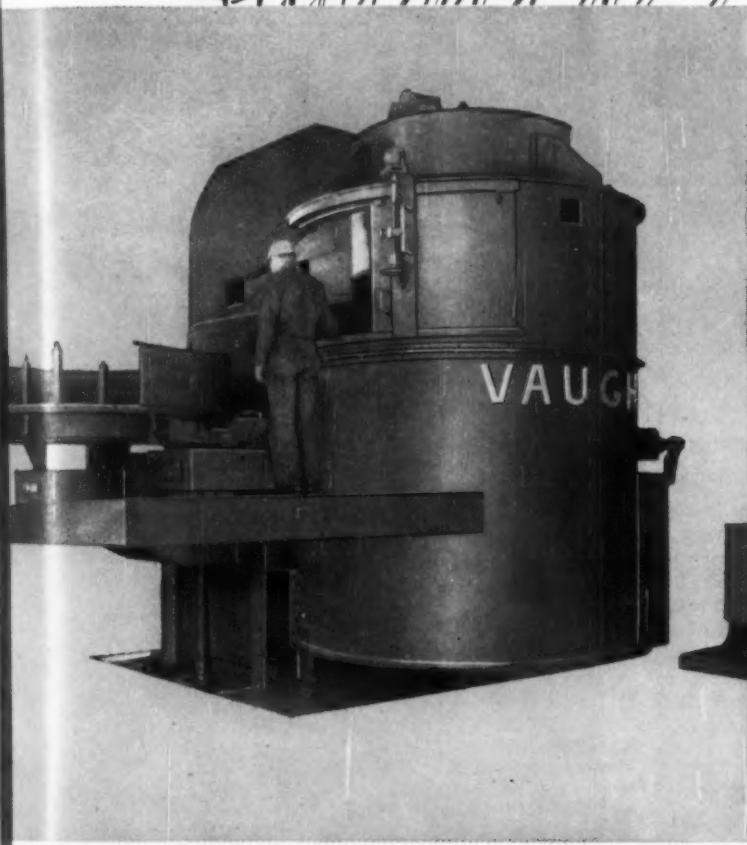
Big Move—The Bettinger Corp. has moved into its \$1.5 million plant which is designed and equipped for volume production of ceramic-on-metal products. The plant is located in Milford, Mass.

Rubber Plant—The Firestone Tire & Rubber Co., Akron, O., will build a plant for production of synthetic Diene and Coral rubbers. Diene is a partial replacement for natural rubber, and Coral is a complete replacement. The plant will be an addition to the company's Petrochemical Center in Orange, Tex.

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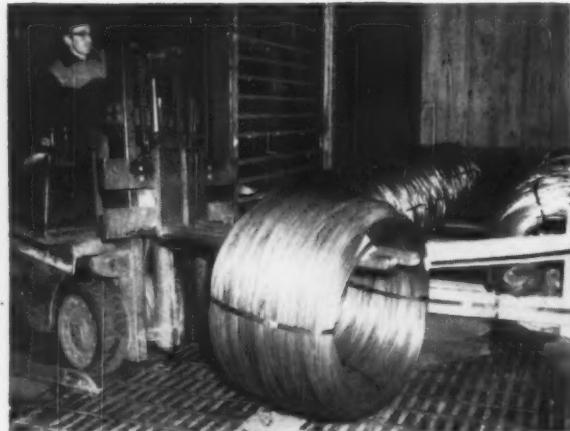
A Section of the Straightening-and-Cutting Department of a DSC Customer's Bright Wire Fabricating Plant.

THIS SCENE looks familiar but it really isn't. What makes the difference? Those two big coils feeding the straighteners-and-cutters. They are LPR's. When shipped, each weighed 1800/2000 pounds in a single length of wire. Not shown in the picture are the other two machines in this setup—all four of them run by the lone operator. Best previous operation here with 600 pound coils was one man, three machines. *That's an improvement of 33½% in machine utilization alone. Now using LPR's on 75% of his requirements, this customer reports a 15% drop in overall man-hour costs. Other users report savings of 20%.*

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The IRON AGE

Official Steel Ingot Capacities

Ingot Capacity by Districts

DISTRICT—COMPANY	Rated Annual Capacity—Net Tons					DISTRICT—COMPANY	Rated Annual Capacity—Net Tons					DISTRICT—					
	1959	1958	1957	1956	1955		1959	1958	1957	1956	1955						
CHICAGO												WESTERN					
Acme Steel Co.	451,760					Alan Wood Steel Co.	800,000	800,000	800,000	625,000	625,000	Bethlehem P.					
American Steel & Wire Div.	973,000	973,000	973,000	973,000	973,000	Armco Steel Corp.	102,000	102,000	102,000	102,000	102,000	Los Angeles					
Borg Warner Corp.						(Rustless Iron & Steel Div.)						San Franci					
Chicago		100,000	100,000	100,000	100,000	Baldwin-Lima-Hamilton Corp.	188,710	188,710	169,960	169,960	169,960	Seattle					
New Castle, Ind.	64,000	64,000	64,000	64,000	64,000	Bethlehem Steel Co.						Total					
Total		164,000	164,000	164,000	164,000	Bethlehem	3,900,000	3,900,000	3,750,000	3,500,000	3,214,000	Cabot Shops,					
Columbia Tool Steel Co.	6,600	6,600	6,600	6,600	6,600	Sparrows Point	8,200,000	8,200,000	6,200,000	6,200,000	6,200,000	Cameron Iron					
Continental Steel Corp.	420,000	420,000	420,000	394,000	394,000	Steelton	1,500,000	1,500,000	1,500,000	1,500,000	1,356,000	Colorado Furn					
A. Finkl & Sons	33,600	33,600	33,600	33,600	33,600	Total	13,600,000	13,600,000	11,450,000	11,200,000	10,770,000	Columbia-Ge					
Inland Steel Co.	6,500,000	5,800,000	5,500,000	5,200,000	5,000,000	Carpenter Steel Co.	87,500	86,600	86,600	73,700	85,800	Geneva					
International Harvester Co.	1,200,000	1,200,000	1,200,000	1,000,000	1,000,000	Claymont Steel (C. F. & I.)	506,500	506,500	499,500	499,500	499,500	Pittsburg					
Joslyn Mfg. & Supply Co.	37,500	37,500	37,500	37,500	37,500	Henry Dillston & Sons, Inc.				25,000	25,000	Torrance					
Northwestern Steel & Wire Co.	825,000	825,000	825,000	825,000	825,000	(H. K. Porter Co., Inc.)						Total					
Republic Steel Corp.	1,789,000	1,697,000	1,382,000	1,232,000	1,232,000	Eastern Stainless Steel Co.	80,000	80,000	50,000	50,000	32,000	Isaacson Iron					
United States Steel Corp.*						Harrisburg Steel Corp.	100,750	100,750	100,750	100,750	100,750	Judson Steel					
Gary	7,990,000	7,204,000	7,204,000	7,204,000	7,196,000	Lukens Steel Co.	930,000	750,000	750,000	750,000	750,000	Kaiser Steel					
South Works	5,589,000	5,441,000	5,441,000	5,441,000	5,470,000	Midvale-Heppenstall Co.	157,700	157,700	163,350	325,000	347,100	R. G. Le Tou					
Total	13,588,000	12,645,000	12,645,000	12,645,000	12,666,000	Milton Steel Products Div.	90,000	90,000	90,000	90,000	67,000	Lone Star Ste					
Youngstown Sheet & Tube Co.	3,420,000	3,280,000	3,144,000	2,738,000	2,676,000	(Merritt-Chapman & Scott)						National Sup					
TOTAL Chicago District	29,288,460	27,081,700	26,340,700	25,248,700	25,007,700	Pencoyd Steel & Forge Corp.	15,600					Northwest Ste					
PITTSBURGH												Oregon Steel					
Allegheny Ludlum Steel Corp.	746,700	746,700	746,700	746,700	746,700	Phoenix Steel Corp.						Pacific State					
Alco Products, Inc.	108,050	104,480	105,180	105,180	103,000	Barium Steel Corp.						Western R.					
American Steel & Wire Div.	1,015,000	1,015,000	1,015,000	1,015,000	1,015,000	Harrisburg	486,760	486,760	486,760	490,000	406,000	Sheffield Ste					
Armco Steel Corp.	557,000	557,000	547,000	543,000	499,000	Phoenixville	360,000	360,000	360,000	360,000	432,000	San Spring					
Babcock & Wilcox Tube Co.	220,450	229,450	220,450	229,450	229,450	Total	846,760	846,760	846,760	850,000		Houston					
Bethlehem Steel Co.	2,400,000	2,400,000	2,330,000	2,330,000	2,330,000	J. A. Roebling's Sons Co. (C. F. & I.)	235,000	235,000	235,000	235,000	235,000	Total					
Braeburn Alloy Steel Corp.	20,730	20,730	20,730	20,730	20,730	United States Steel Corp.	2,687,000	2,400,000	2,200,000	2,200,000	2,200,000	Southwest Ste					
Byers, A. M. Co.	90,000	90,000	90,000	90,000	75,000	TOTAL Philadelphia District	20,427,520	19,944,020	17,543,920	17,295,910	16,847,110	Texas Steel					
Colonial Steel Co.	30,000	30,000	30,000	30,000	30,000	VALLEY (Youngstown)											
Crucible Steel Co.	1,382,000	1,356,000	1,356,000	1,356,000	1,284,000	Copperweld Steel Co.	680,000	680,000	680,000	618,380	618,380	Allegheny Lu					
Edgewater Steel Co.	117,600	117,600	117,600	117,600	89,500	Empire-Reeves Steel Co.	500,000	500,000	500,000	500,000	500,000	Dunkirk					
Firth Sterling, Inc.	20,040	20,040	20,040	20,040	20,040	Industrial Forge & Steel, Inc.	84,000	84,000	48,600	48,600	48,600	Tonawanda					
Heppenstall Steel Co.	55,550	55,550	55,550	55,550	55,550	Mesta Machine Co.	66,000	66,000	36,000			Total					
Jessop Steel Co.	35,800	35,740	35,740	33,490	33,490	Republic Steel Corp.						Bethlehem Ste					
Jones & Laughlin Steel Corp.						Canton	1,045,000	1,025,000	1,315,000	1,125,000	1,125,000	Erie Forge &					
Aliquippa	2,378,000	2,180,000	1,900,000	1,764,000	1,764,000	Massillon	680,000	620,000	620,000	620,000	620,000	National Forge					
Pittsburgh	3,379,000	3,300,000	3,300,000	3,097,500	3,097,500	Warren	1,820,000	1,408,000	1,000,000	900,000	900,000	Republic Stee					
Total	5,755,000	5,480,000	5,200,000	4,881,500	4,881,500	Youngstown	2,129,000	2,053,000	2,189,000	2,142,000	2,142,000	Simonds Saw					
Latrebo Steel Co.	24,000	24,000	24,000	24,000	24,000	Total	5,374,000	5,106,000	5,124,000	4,787,000	4,787,000	Celerade Fuel					
Mesta Machine Co.	105,000	105,000	105,000	105,000	105,000	Sharon Steel Co.						TOTAL Buffal					
National Tube Div.	1,392,000	1,448,000	1,448,000	1,448,000	1,448,000	Farrell	1,268,000	1,398,000	1,305,000	1,170,000	1,008,000	Allegheny Lu					
Pittsburgh Steel Co.	1,580,000	1,416,000	1,320,000	1,320,000	1,404,000	Lowellville	583,000	583,000	583,000	583,000	583,000	Ford Motor C					
Union Electric Steel Corp.	25,000	25,000	26,760	26,760	26,760	Total	1,881,000	1,989,000	1,888,000	1,783,000	1,550,000	Great Lakes					
Universal-Cyclops Steel Co.	77,410	70,180	70,180	70,180	70,180	Timken Roller Bearing Co.	700,000	700,000	700,000	700,000	648,000	(National)					
United States Steel Corp.*						United States Steel Corp.	2,923,000	2,943,000	2,943,000	2,943,000	2,943,000	McLouth Ste					
Claireton	1,064,000	1,064,000	1,064,000	1,064,000	1,064,000	Youngstown Sheet & Tube Co.						Jones & Lau					
Duquesne	1,741,600	1,521,600	1,521,600	1,503,000	1,482,000	Brier Hill	1,510,000	1,448,000	1,368,000	1,248,000	1,176,000	National Tu					
Edgar Thompson	2,629,000	2,179,000	2,179,000	2,179,000	2,179,000	Campbell	1,800,000	1,772,000	1,728,000	1,764,000	1,668,000	Republic Ste					
Homestead	4,426,000	4,287,000	4,043,000	4,035,000	3,766,000	Total	3,330,000	3,220,000	3,098,000	3,012,000	2,844,000	TOTAL Cleve					
Johnstown	25,000	25,000	25,000	25,000	25,000	TOTAL Valley District	15,498,000	15,268,000	15,005,000	14,371,000	13,938,000						
Total	9,785,000	8,056,000	8,532,000	8,806,000	8,486,000												
Vanadium-Alloys Steel Co.	12,000	12,000	12,000	12,000	12,000												
Vulcan-Kidd Steel Div.	9,800	9,800	9,800	9,800	9,800												
(H. K. Porter, Co., Inc.)																	
TOTAL Pittsburgh District	25,533,530	24,422,030	23,744,480	23,373,740	22,986,070												

* Central operations.

Cities By IRON AGE Districts

Source:
American Iron and Steel Institute

DISTRICT-COMPANY

Rated Annual Capacity—Net Tons

1959 1958 1957 1956 1955

WESTERN

Bethlehem Pacific Coast Steel Co.					
Los Angeles.....	478,000	478,000	478,000	452,000	402,000
San Francisco.....	276,000	276,000	276,000	252,000	252,000
Seattle.....	246,000	246,000	246,000	246,000	246,000
Total.....	1,000,000	1,000,000	1,000,000	950,000	900,000
Cabot Shops, Inc.	16,200	14,500	14,500	12,000	12,000
Cameron Iron Works.....	58,800	58,800	58,800	58,800	58,800
Colorado Fuel & Iron Corp.	1,800,000	1,800,000	1,800,000	1,485,000	1,485,000
Columbia-Geneva Steel Div.					
Geneva.....	2,300,000	2,262,000	2,077,000	1,937,000	1,879,000
Pittsburg.....	380,000	380,000	380,000	380,000	381,000
Torrance.....	228,000	228,000	222,000	222,000	220,000
Total.....	2,808,000	2,870,000	2,679,000	2,539,000	2,490,000
Isaacson Iron Works.....	102,000	102,000	102,000	102,000	102,000
Judson Steel Co.	76,500	76,500	76,500	76,500	76,500
Kaiser Steel Corp.	2,933,000	1,536,000	1,536,000	1,536,000	1,536,000
R. G. LeTourneau, Inc.	90,000	90,000	83,100	83,100	83,100
Lone Star Steel Co.	500,000	660,000	550,000	550,000	550,000
National Supply Co.	50,000	50,200	50,200	50,200	50,200
Northwest Steel Rolling Mills....	53,000	53,000	48,600	46,000	42,000
Oregon Steel Mills.....	150,000	150,000	120,000	120,000	120,000
Pacific States Steel Corp.	216,000	216,000	216,000	181,770	181,770
Western Rolling Mills, Div.	60,000				
Sheffield Steel Corp. (Armco)....					
San Springs.....	120,000	120,000	120,000	60,000	54,000
Houston.....	1,284,000	1,284,000	1,200,000	1,050,000	1,050,000
Total.....	1,404,000	1,404,000	1,320,000	1,110,000	1,104,000
Southwest Steel Rolling Mills....	45,000	45,000	45,000	45,000	45,000
Texas Steel Corp.	132,450	132,450	70,450	70,450	38,000
TOTAL Western District.....	11,894,950	10,258,450	9,782,150	9,027,820	8,884,370

BUFFALO

Allegheny Ludlum Steel Co.					
Dunkirk.....	33,000	33,000	33,000	33,000	33,000
Tonawanda.....	4,500	4,500	4,500	4,500	4,500
Total.....	37,500	37,500	37,500	37,500	37,500
Bethlehem Steel Co.	6,000,000	6,000,000	5,720,000	5,520,000	5,100,000
Erie Forge & Steel Co.	264,000	234,000	234,000	234,000	234,000
National Forge & Ordnance Co.	25,000	25,000	25,000	25,000	25,000
Republic Steel Corp.	900,000	882,000	882,000	882,000	882,000
Simonds Saw & Steel Co.	21,000	21,000	21,000	21,000	21,000
Colorado Fuel & Iron Corp.	295,000	295,000	265,000	265,000	252,000
TOTAL Buffalo District.....	7,563,100	7,495,100	7,215,100	7,015,100	6,552,100

DETROIT

Allegheny Ludlum Steel Corp.	3,000	3,000	3,000	3,000	3,000
Ford Motor Co.	1,856,000	1,898,000	1,877,400	1,877,420	1,785,000
Great Lakes Steel Co.	3,700,000	3,500,000	3,200,000	3,200,000	3,400,000
(National Steel Corp.)					
McLouth Steel Corp.	2,046,000	1,574,000	1,380,000	1,380,000	1,200,000
Jones & Laughlin Steel Corp.	306,000	290,000	300,000	300,000	425,000
TOTAL Detroit District.....	7,641,000	7,175,000	6,700,400	6,700,420	6,783,000

CLEVELAND

Jones & Laughlin Steel Corp.	1,945,000	1,820,000	1,400,000	1,305,000	1,305,000
National Tube Div.	2,645,000	2,580,000	2,545,000	2,364,000	2,364,000
Republic Steel Corp.	3,490,000	3,360,000	2,940,000	2,572,000	2,572,000
TOTAL Cleveland District.....	8,083,000	7,780,000	6,825,000	6,241,000	6,241,000

DISTRICT-COMPANY

Rated Annual Capacity—Net Tons

1959 1958 1957 1956 1955

SOUTHERN

Atlantic Steel Co.	400,000	400,000	400,000	450,000	300,000
Connors Steel Div.	115,000	115,000	115,000	115,000	67,500
(H. K. Porter Co., Inc.)					
Florida Steel Corp.	43,000				
Kilby Steel Co.	34,020	34,020	34,020	34,020	34,020
Knoxville Iron Co.	38,000	38,000	38,000	38,000	38,000
Mississippi Steel Corp.	45,000	45,000	45,000		
Newport News S. & D. Co.	15,000	15,000	12,000	12,000	12,000
Republic Steel Corp.	1,209,000	1,197,000	789,000	789,000	789,000
Roanoke Electric Steel Corp.	25,000	25,000	24,000		
Southern Electric Steel Co.	66,000	66,000	66,000		
Tennessee Coal & Iron Div.					
Ensley.....	1,770,000	1,770,000	1,770,000	1,770,000	1,770,000
Fairfield.....	2,227,000	2,227,000	2,227,000	2,227,000	2,227,000
Total.....	3,997,000	3,997,000	3,997,000	3,997,000	3,997,000
TOTAL Southern District.....	5,987,020	5,932,000	5,520,020	5,435,020	5,237,520

UPPER OHIO RIVER †

Ohio River Steel Div.	136,080	136,080	136,080	136,080	136,080
(Louis Berkman Co.)					
Weirton Steel Co.	3,300,000	3,300,000	3,000,000	2,800,000	2,600,000
(National Steel Corp.)					
Wheeling Steel Corp.					
Steubenville.....	2,400,000	2,400,000	2,200,000	2,130,000	2,130,000
TOTAL Wheeling District.....	5,836,080	5,836,080	5,336,080	5,066,080	4,866,080

SOUTH OHIO RIVER

American Compressed Steel Co.	21,600	21,600	21,600	21,600	21,600
Armco Steel Corp.					
Ashland.....	1,022,000	984,000	952,000	950,000	900,000
Middletown.....	2,557,000	2,493,000	2,249,000	1,815,000	1,715,000
Total.....	3,579,000	3,477,000	3,201,000	2,765,000	37,500
Connors Steel Div.					
Harrison.....	110,000	84,000	84,000	78,840	72,000
Detroit Steel Co.	1,500,000	1,500,000	1,500,000	1,290,000	1,290,000
Green River Steel Co.	183,190	183,190	183,190	179,400	198,000
Acme-Newport Steel Co.	608,000	608,000	608,000	706,500	706,500
TOTAL South Ohio District.....	6,001,780	5,873,780	5,597,780	5,043,340	4,905,100

ST. LOUIS

Granite City Steel Co.	1,440,000	1,200,000	1,200,000	1,080,000	1,290,000
Keystone Steel & Wire Co.	475,000	450,000	450,000	425,000	425,000
Laclede Steel Co.	600,000	600,000	500,000	500,000	500,000
Sheffield Steel Div. (Armco)	708,000	604,000	780,000	630,000	630,000
TOTAL St. Louis District.....	3,223,000	3,054,000	2,930,000	2,635,000	2,845,000

NORTHEAST

Allegheny Ludlum Steel Co.	77,000	77,000	77,000	77,000	77,000
American Steel & Wire Div.					
Crucible Steel Co. of America					
Harrison.....	7,800	7,800	7,800	7,800	7,800
Syracuse.....	61,380	60,730	59,600	59,600	59,600
Total.....	69,180	68,530	67,400	67,400	67,400
Carpenter Steel Co. of N. E.	84,000	84,000	303,200	303,200	185,200
Washburn Wire Co.	93,000	93,000	93,000	93,000	93,000
Wickwire Brothers, Inc.	32,440	32,250	30,300	21,300	26,000
TOTAL Northeast District.....	356,620	641,700	857,900	848,900	733,400

† Formerly "Wheeling."

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Steel Capacity

• Steelmakers added 6.9 million ingot tons to U. S. capacity during '58. This and other capital improvements cost \$1.2 billion. Further spending of over \$1 billion is expected this year.

Oxygen steelmaking equipment played a big part in the 1958 capacity gain, rising almost 3 million tons.

■ The nation's steelmakers boosted capacity by 6.9 million tons last year.

This gain—while not a record—was not far below the all-time high of 7.3 million tons added in 1957. Steelmaking capacity is now 147.6 million ingot tons—an increase of 4.9 pct over last year's 140.7 million tons.

More Spending in '59—This capacity expansion and other capital improvements cost the industry \$1.2 billion, according to American Iron and Steel Institute. It raised the postwar total spending for new equipment to more than \$11 billion dollars.

Another large sum, estimated by the AISI at more than \$1 billion, will be spent during 1959.

Above the Average—Record capacity gains were not expected in '58, following the large-scale additions in 1957. Spending for

modernization and expansion was due for a cut. The adverse climate of the recession was also a dampening influence.

Nevertheless the 6.9 million ton boost was well above the average 4.6 million ton yearly expansion since 1953.

Oxygen steelmaking was important in the 1958 capacity increase. A sizable share of the gain was for new oxygen equipment, according to AISI. During 1958 the annual capacity of oxygen furnaces jumped from 1,081,000 net tons to 4,033,160 net tons.

Openhearth Gains—In 1958 openhearth capacity rose by 4.2 million tons. This was well under the 5.4 million ton increase in 1957. Openhearth capacity—which accounts for 85 pct of U. S. steelmaking—is now 126.5 million tons, up from 122.3 million tons.

Electric furnace capacity, now 13.5 million tons, gained only

slightly—200,000 tons. Bessemer steelmaking declined in '58, down 400,000 tons to a new capacity of 3.6 million tons.

District Increases—A breakdown by IRON AGE producing districts (see below) shows three areas—Chicago, Pittsburgh, and the West—accounted for over two-thirds of the capacity gain.

Chicago with a healthy 32 pct of the U. S. increase, raised district capacity to 29,288,460. Second biggest gain was made by the West. Its 24 pct of the total added 1.6 million tons for a capacity of 11,894,950 tons.

Mills in the Pittsburgh district increased capacity by 1,111,500 tons for a new total of 25,533,530 tons. The Detroit area added 766,000 tons.

During 1958 blast furnace capacity rose 3.6 million tons to a record level of 94.6 million tons. There was a slight increase in coke capacity, regaining the loss of 800,000 tons in '57. New coke capacity is 73 million tons.

IRON AGE DISTRICT CHANGES AT A GLANCE

District	Pct of U. S. Capacity		Increase in Capacity		Pct of U. S. Increase
	1959	1958	Net Tons	Pct	
Chicago	19.84	19.24	2,206,760	8.1	32.0
Pittsburgh	17.30	17.35	1,111,500	4.5	16.1
Philadelphia	13.84	14.17	483,500	2.4	7.0
Valley	10.50	10.84	230,000	1.5	3.3
West	8.05	7.28	1,636,500	15.9	23.8
Cleveland	5.47	5.51	323,000	4.1	4.7
Detroit	5.38	5.09	766,000	1.06	11.1
Buffalo	5.12	5.32	68,000	9.0	1.0
South Ohio River	4.07	4.17	128,000	2.1	1.8
South	4.05	4.21	55,020	9.2	0.8
Upper Ohio River	3.96	4.14	N.C.		
St. Louis	2.18	2.16	169,000	5.5	2.4
Northeast	0.24	0.45	-286,160	-44.5	-4.0
Total	100.00	100.00	6,891,120	4.9	100.00

Official Steel Industry Capacities

Source: American Iron and Steel Institute

THE IRON AGE DISTRICTS STEEL CAPACITY

In Thousands of Net Tons—Source: American Iron and Steel Institute—Compilations: The Iron Age

District	1959		1958		1957		1956		1955	
	Net Tons	Pct of Total								
Chicago	29,288	19.84	27,081	19.24	26,341	19.74	25,249	19.67	25,008	19.87
Pittsburgh	25,533	17.30	24,422	17.35	23,744	17.79	23,374	18.21	22,987	18.27
Philadelphia	20,427	13.84	19,944	14.17	17,544	13.15	17,308	13.48	16,859	13.40
Valley	15,498	10.50	15,268	10.84	15,006	11.24	14,372	11.20	13,939	11.08
Western	11,894	8.05	10,258	7.28	9,782	7.33	9,028	7.03	8,884	7.06
Cleveland	8,083	5.47	7,760	5.51	6,825	5.11	6,241	4.86	6,241	4.96
Detroit	7,941	5.38	7,175	5.09	6,760	5.07	6,760	5.27	6,783	5.39
Buffalo	7,562	5.12	7,495	5.32	7,215	5.41	7,015	5.46	6,552	5.21
South Ohio River	6,001	4.07	5,873	4.17	5,598	4.19	5,043	3.93	4,905	3.90
Southern	5,987	4.05	5,932	4.21	5,520	4.14	5,423	4.22	5,226	4.15
Upper Ohio River	5,836	3.96	5,836	4.14	5,336	4.00	5,066	3.95	4,866	3.87
St. Louis	3,223	2.18	3,054	2.16	2,930	2.19	2,635	2.05	2,845	2.26
Northeast	350	0.24	641	0.45	857	0.64	849	0.66	733	0.58
Total	147,633	100.00	140,742	100.00	133,459	100.00	128,363	100.00	125,828	100.00

BLAST FURNACE CAPACITIES BY COMPANIES AND GEOGRAPHIC LOCATIONS

Annual Capacity of Blast Furnaces as of January 1, 1959

	No. of stacks	Total annual capacity (M. T.)
Companies:		
Alan Wood Steel Company	2	544,200
Armco Steel Corporation	6	2,353,000
Sheffield Division	1	500,000
TOTAL	7	2,853,000
Baumit Steel Corporation:		
Phoenix Iron and Steel Co.	1	200,000
Berkman Company, Louis	1	136,800
Bethlehem Steel Company	34 (a)	15,000,000
Colorado Fuel and Iron Corporation	7	1,463,600
Crucible Steel Company of America	3	895,000
Detroit Steel Corporation	2	768,700
Easmet Gas and Fuel Associates	1	195,000
Ford Motor Company	3	1,104,210
Granite City Steel Company	2	329,000
Inland Steel Company	8	3,235,300
Interlake Iron Corporation	7	1,630,000
International Harvester Company	3	808,000
Jackson Iron & Steel Company	1	95,000
Jones & Laughlin Steel Corporation	13	5,061,000
Kaiser Steel Corporation	4	1,912,100
Lake Erie Company, E. J.	3 (b)	184,000
Lone Star Steel Corporation	1	185,000
McLouth Steel Corporation	2	1,239,220
Merritt-Chapman & Scott Corp.		
Tennessee Products & Chemical Corp.	3	217,740
National Steel Corporation:		
Great Lakes Steel Corporation	4	2,500,000
Hanna Furnace Corporation	4	850,000
Weirton Steel Company Division	4	2,400,000
TOTAL	12	5,750,000
New Jersey Zinc Company	2 (c)	112,000
Pittsburgh Coke & Chemical Company	3	836,500
Pittsburgh Steel Company	3	950,000
Republic Steel Corporation	22	7,902,000
Shawnee Steel Corporation	3	884,000
Shenango Furnace Company	2	445,450
Tonawanda Iron Division, American		
Radiator & Stand. Sanitary Corp.	1	165,000
United States Pipe & Foundry Co.	5	819,700
United States Steel Corporation:		
United States Steel Corp. (Central Operations)	53	(d) 20,998,100
American Steel & Wire Division	6	1,693,000
Columbia-Geneva Steel Division	5	1,804,200

(a) Includes 240,000 tons ferroalloys capacity.
(b) Ferromanganese only.
(c) Spiegeleisen only.
(d) Includes 302,500 tons ferroalloys capacity.

Capacity of Blast Furnaces — January 1, 1959 (Continued)

	No. of stacks	Total annual capacity (M. T.)
Companies (Continued):		
National Tube Division	9	3,381,000
Tennessee Coal & Iron Division	9 (e)	3,217,400
TOTAL	82 (f)	31,093,700
Wheeling Steel Corporation	6	1,954,000
Woodward Iron Company	4	772,630
Youngstown Sheet & Tube Company	13	4,140,000
GRAND TOTAL	266 (g)	94,634,850
Plant Location and Operating Company:		
Alabama		
Birmingham		
Republic Steel Corporation	2	402,000
United States Pipe & Foundry Co.	1	285,220
Illinois		
Ensey		
Tennessee Coal & Iron Division	6 (e)	1,829,000
Indiana		
Tennessee Coal & Iron Division	3	1,388,400
Michigan		
Republic Steel Corporation	2	525,000
North Birmingham		
United States Pipe & Foundry Co.	3	534,480
Woodward		
Woodward Iron Company	4	772,630
TOTAL	22	5,736,730
Minnesota		
Fontana		
Kaiser Steel Corporation	4	1,912,100
Mississippi		
Missouri		
Kentucky		
Askinland		
Armco Steel Corporation		
Maryland		
Sparrows Point		
Bethlehem Steel Company		
Massachusetts		
Everett		
Eastern Gas and Fuel Associate		
Michigan		
Dearborn		
Ford Motor Company		
River Rouge		
Great Lakes Steel Corporation		
Trenton		
McLouth Steel Corporation		
TOTAL		
Minnesota		
Duluth		
American Steel & Wire Division		
Interlake Iron Corporation		
TOTAL		
New York		
Buffalo		
Hannay Furnaces Corporation		
Republic Steel Corporation		
Lakewood		
Bethlehem Steel Company		
North Tonawanda		
Tonawanda Iron Division		
Tonawanda		
Colorado Fuel & Iron Corporation		
Troy		
Republic Steel Corporation		
TOTAL		

(e) Includes 39,000 tons ferroalloys capacity.
(f) Includes 341,500 tons ferroalloys capacity.
(g) Includes 877,500 tons ferroalloys capacity.

COKE CAPACITY

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Annual Coke Capacity as of January 1, 1959
(Coke Capacity of Iron and Steel Industry)

	BETHLEHEM	OTHER	Total annual capacity (N. T.)
	No. of ovens	No. of ovens	No. of ovens
Companies:			
Alan Wood Steel Company.....	151	600,000	600,000
Armco Steel Corporation.....	186	995,000	995,000
Sheffield Division	63	394,000	394,000
TOTAL	248	1,389,000	1,389,000
Bethlehem Steel Company.....	2,153	11,428,000	11,428,000
Colorado Fuel and Iron Corporation.....	286	1,011,000	1,011,000
Crucible Steel Company of America.....	213	790,000	790,000
Detroit Steel Corporation.....	108	550,000	550,000
Eastern Gas and Fuel Associates.....	108	460,000	460,000
Ford Motor Company.....	239	1,449,210	1,449,210
George City Coal Company.....	76	450,000	450,000
Inland Steel Company.....	531	2,847,000	2,847,000
Interlake Iron Corporation.....	379	1,653,000	1,653,000
International Harvester Company.....	152	1,000,000	1,000,000
Jones-Laudlin Steel Corporation.....	83	3,586,000	3,586,000
Kaiser Steel Corporation.....	397	100,000	1,502,000
Lone Star Steel Company.....	315	78	438,000
Merritt-Chapman & Scott Corp.....	44	251,500	251,500
National Steel Corporation.....	794	2,000,000	2,000,000
Great Lakes Steel Corporation.....	120	*585,000	*585,000
Hanna Furnace Corporation.....	299	1,900,000	1,900,000
Weirton Steel Company Division.....			
TOTAL	714	4,485,000	4,485,000
Pittsburgh Coke & Chemical Company.....	140	1,000,000	1,000,000
Pittsburgh Steel Company.....	320	228,000	93
Republic Steel Corporation.....	296	215,000	1,065
Sharon Steel Corporation.....	60	236,000	236,000
Carpenterstown Coal & Coke Co.....	277	160,000	160,000
TOTAL	277	160,000	60
United States Pipe & Foundry Co.....			
United States Steel Corporation.....			
United States Steel Corp. (Central Operations).....	1,147	687,500	2,903
American Steel & Wire Division.....			14,185,900
Columbia-Geneva Steel Division.....			1,418,100
National Tube Division.....			1,345,700
Tennessee Coal & Iron Division.....			1,069,000
TOTAL	1,147	687,500	21,915,600
Wheeling Steel Corporation.....			22,603,100
Woodward Iron Company.....			314
Youngstown Sheet and Tube Company.....			1,720,000
GRAND TOTAL	2,337	1,390,500	14,043
71,707,810	73,988,310		

* Includes 50% of coke capacity of the Donner-Hanna Coke Corporation, Buffalo, New York.

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Pct of Total

19.87
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13.40
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7.06
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5.39
5.21
3.90
4.15
3.87
2.26
0.58

100.00

IC LOCATION

of Blast Furnaces — January 1, 1959 (Continued)

	Total annual capacity (N. T.)
No. of stacks	
El Company.....	3,325,300
Sheet and Tube Company.....	1,296,000
ates Steel Corp. (Central)	
TOTAL	12
1	5,075,400
TOTAL	23
9,696,700	
el Corporation.....	1,058,000
oint Steel Company.....	5,480,000
as and Fuel Associates.....	195,000
or Company.....	1,104,210
es Steel Corporation.....	2,500,000
Steel Corporation.....	1,239,220
TOTAL	9
4,843,430	
Steel & Wire Division.....	491,000
Iron Corporation.....	146,000
TOTAL	3
637,000	
ane Corporation.....	850,000
ital Corporation.....	683,000
Steel Company.....	3,590,000
Iron Division.....	165,000
Fuel & Iron Corporation.....	390,000
Steel Corporation.....	263,000
TOTAL	17
5,941,000	

Capacity of Blast Furnaces — January 1, 1959 (Continued)

	No. of stacks	Total annual capacity (N. T.)
Ohio (Youngstown Area)		
Campbell		
Youngstown Sheet and Tube Company	4	1,452,000
Hubbard		
Youngstown Sheet and Tube Company	1	204,000
Lowellville		
Sharon Steel Corporation.....	1	149,000
Struthers		
Pittsburgh Coke & Chemical Company.....	1	183,500
Republic Steel Corporation.....	1	569,000
Youngstown		
Republic Steel Corporation.....	5	1,773,000
United States Steel Corp. (Central Operations).....	5	1,937,200
Youngstown Sheet and Tube Company.....	2	504,000
SubTotal (Youngstown Area)	20	6,770,700
Ohio (Central and South)		
Canton		
Republic Steel Corporation.....	1	266,000
Jackson		
Interlake Iron Corporation.....	1	75,000
Jackson Iron & Steel Company.....	1	95,000
Martins Ferry		
Louis Berman Company.....	1	138,800
Middletown		
Republic Steel Corporation.....	1	266,000
New Miami		
Arco Steel Corporation.....	1	691,000
New Miami		
Arco Steel Corporation.....	2	694,000
Portsmouth		
Detroit Steel Corporation.....	2	788,700
Steubenville		
Wheeling Steel Corporation.....	5	1,708,000
SubTotal (Central and South)	15	4,610,500
Ohio (Lake Area)		
Cleveland		
American Steel & Wire Division.....	2	752,000
Jones & Laughlin Steel Corporation.....	2	865,000
Republic Steel Corporation.....	6	1,586,000
Lorain		
National Tube Division.....	5	2,073,000
Toledo		
Interlake Iron Corporation.....	2	551,000
SubTotal (Lake Area)	17	6,828,000
TOTAL — Ohio	52	18,109,200

Capacity of Blast Furnaces — January 1, 1959 (Continued)

	No. of stacks	Total annual capacity (N. T.)
Pennsylvania (Eastern)		
Bethlehem		
Bethlehem Steel Company.....	7	2,720,000
Carderboro		
Colorado Fuel and Iron Corporation.....	1	151,200
Chester		
Barium Steel Corp.: Phoenix Iron and Steel Co.....	1	200,000
Fairless Hills		
United States Steel Corp. (Central Operations).....	3	1,878,000
Palmerston		
New Jersey Zinc Company.....	2	(a) 112,000
Midland		
Lavens and Company, E. J.....	1	(b) 56,000
Scranton		
Bethlehem Steel Company.....	3	1,020,000
Swedeland		
Alan Wood Steel Company.....	2	544,200
SubTotal (Eastern)	20	6,681,400
Pennsylvania (Western) (Excl. Pk. Area)		
Aliquippa		
Johns & Laughlin Steel Corporation.....	3	2,090,000
Dover		
American Steel & Wire Division.....	2	430,000
Erie		
Interlake Iron Corporation.....	1	271,000
Farrell		
Sharon Steel Corporation.....	2	735,000
Johnstown		
Bethlehem Steel Company.....	7	(c) 2,190,000
Midland		
Crucible Steel Company of America.....	3	895,000
Murphy		
Pittsburgh Steel Company.....	3	930,000
Sharpsville		
Shenango Furnace Company.....	2	445,450
SubTotal (Western)	23	8,026,450
Pennsylvania (Pittsburgh Area)		
Braddock		
United States Steel Corp. (Central Operations).....	7	2,994,400
Clairton		
United States Steel Corp. (Central Operations).....	3	821,900
(a) Spiegelsches only. (b) Ferromanganese only. (c) Includes 240,000 tons ferroalloys capacity.		

STEEL CAPACITY →
BY COMPANIES AND TYPES

The IRON AGE

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READERS SERVICE DEPARTMENT

The IRON AGE
Chestnut and 56th Streets
Philadelphia 39, Pa.

Capacity of Blast Furnaces — January 1, 1959 (Continued)

	Total No. of stacks	Total annual capacity (M. T.)
Pennsylvania (Cont'd) (Pittsburgh Area)		
Duquesne		
United States Steel Corp. (Central Operations)	6 (a)	1,473,600
McKeesport		
National Tube Division	3	1,308,000
Neville Island		
Pittsburgh Coke & Chemical Company	2	654,000
Pittsburgh		
Jones & Laughlin Steel Corporation	6	2,105,000
Rankin		
United States Steel Corp. (Central Operations)	6	2,453,400
SubTotal (Pittsburgh Area)	34	11,720,300
TOTAL — Pennsylvania	79	26,428,150
Tennessee		
Lyles-Wright		
Merritt-Chapman & Scott Corp.		
Tennessee Products & Chemical Corp.	1	36,300
Rockwood		
Merritt-Chapman & Scott Corp.		
Tennessee Products & Chemical Corp.	1	181,440
TOTAL	3	217,740
Texas		
Houston		
Sheffield Division	1	500,000
Lone Star		
Lone Star Steel Company	1	385,000
TOTAL	2	885,000
Utah		
Geneva		
Columbia-Geneva Steel Division	3	1,321,500
Provo		
Columbia-Geneva Steel Division	2	482,700
TOTAL	5	1,804,200
Virginia		
Lynchburg		
Levino and Company, E. J.	2 (b)	128,000
West Virginia		
Bethelwood		
Wheeling Steel Corporation	1	346,000
Weirton		
Weirton Steel Company Division	4	2,400,000
TOTAL	5	2,646,000
GRAND TOTAL	266 (c)	94,634,450

(a) Includes 302,500 tons ferroalloys (b) Ferromanganese only.

(c) Includes 877,500 tons ferroalloys capacity.

Annual Steel Capacity (Ingots and Steel for Castings) as of January 1, 1959	OPEN HEARTH		BESSEMER		BASIC OXYGEN PROCESS		ELECTRIC AND CRUCIBLE		Total annual capacity (M. T.)
	No.	Annual capacity (M. T.)	No.	Annual capacity (M. T.)	No.	Annual capacity (M. T.)	No.	Annual capacity (M. T.)	
Kinds:									
Open Hearth—Basic	886	125,708,990							125,708,990
Open Hearth—Acid	34	819,390							819,390
Bessemer			31	3,577,000					3,577,000
Basic Oxygen Process					13	4,033,160			4,033,160
Electric							290	13,495,090	13,495,090
Crucible							1	40	40
TOTAL	920	126,528,380	31	3,577,000	13	4,033,160	291	13,495,130	147,633,670
Companies:									
Acme Steel Co.							2	451,760	451,760
Acme-Newport Steel Co	7	325,000					3	283,000	608,000
TOTAL	7	325,000					3	283,000	1,659,768
Alan Wood Steel Co.	9	800,000							800,000
Alico Products, Inc.	3	105,850					1	2,800	108,650
Allegheny Ludlum Steel Corp.	5	312,000					30	552,200	864,200
American Compressed Steel Corp.							1	21,600	21,600
Arco Steel Corp.	28	3,769,000					9	469,000	4,238,000
Sheffield Division	12	1,344,000					5	768,000	2,112,000
National Supply Co.							3	50,000	50,000
TOTAL	40	5,113,000					17	1,387,000	6,400,000
Atlantic Steel Co.	3	124,000					2	276,000	400,000
Babcock & Wilcox Co.							4	329,450	329,450
Baldwin-Lima-Hamilton Corp.	5	169,920					(b) 2	18,700	188,710
Bartam Steel Corp.									
Phoenix Iron & Steel Co.							1	40,000	846,760
Berkman Co., Louis									136,000
Ohio River Steel Division	4	136,000							
Bethlehem Steel Corp.							6	230,000	22,000,000
Bethlehem Pacific Coast Steel Corp.	132	21,434,000	3	336,000			5	724,000	1,000,000
TOTAL	137	21,710,000	3	336,000			11	954,000	23,000,000
Borg-Warner Corp.									
Ingersoll Steel Division							4	64,000	64,000
Brasburn Alloy Steel Corp.							2	20,730	20,730
Eby Co., A. M.							2	90,000	90,000
Cabot Shops, Inc.							1	15,000	15,000
Cameron Iron Works, Inc.							3	58,000	58,000
Carpenter Steel Co.							7	87,500	87,500
Carpenter Steel of N. E., Inc.							2	84,000	84,000
TOTAL							9	171,500	171,500
Colorado Fuel & Iron Corp.	27	2,601,500							2,601,500
Roebling's Sons Corp., J. A.	9	235,000							235,000
TOTAL	36	2,836,500							2,836,500
Columbia Tool Steel Co.							2	6,600	6,600
Continental Steel Corp.									420,000
Copperfield Steel Co.							7	660,000	660,000
Crucible Steel Company of America	9	1,044,000					25	347,180	1,431,180
Detroit Steel Corp.	15	1,590,000					5	80,000	1,590,000
Edgewater Steel Corp.									117,600
Edgewater Steel Co.	8	117,600					1	50,000	284,000
Eric Forge & Steel Corp.	5	334,000					3	33,600	33,600
Fink & Sons Co., A.							2	20,000	20,000
Firth-Robertson, Inc.							1	43,000	43,000
Florida Steel Corp.							5	221,450	1,989,600
Ford Motor Co.	10	1,677,150							1,440,000
Granite City Steel Co.									100,750
Harrisburg Steel Co.	7	1,440,000					1	5,000	55,550
Division Harco Corp.							5	56,900	157,700
Heppenstall Co.							6	61,900	213,250
Midvale-Heppenstall Co.									
TOTAL	5	151,270							
Industrial Forge & Steel, Inc.									84,000
Inland Steel Co.									6,500,000
International Harvester Co.									1,200,000
Isaacson Iron Works							2	102,000	102,000
Jessop Steel Co.							4	35,800	35,800
Green River Steel Corp.							2	183,190	183,190
TOTAL							6	218,900	218,900
Jones & Laughlin Steel Corp.	37	6,138,000	3	384,000	2	756,000	9	722,000	8,000,000
Joslyn Mfg. & Supply Co.							3	37,500	
Judson Steel Corp.									75,500
Keeler Steel Corp.	9	1,482,000							2,933,000
Keystone Steel & Wire Co.	4	473,000							473,000
Kilby Steel Co.							1	34,020	34,020
Knoxville Iron Co.							2	38,000	38,000
Laclede Steel Co.	4	600,000							600,000
Lakefront Steel Co.							5	80,000	80,000
LeTourneau, Inc., R. G.							3	90,000	90,000
Long Star Steel Co.	5	800,000					1	180,000	938,000
Lukens Steel Co.							5	654,000	2,040,000
McLouth Steel Corp.	13	750,000					4	180,000	
Merritt-Chapman & Scott Corp.							3	90,000	90,000
Midvale Division							1	20,000	20,000
Mesta Machine Co.							1	45,000	45,000
Mississippi Steel Corp.							3	25,000	25,000
National Forge & Ordnance Co.									
National Steel Corp.									
Great Lakes Steel Corp.	17	3,700,000 (a)	2						3,700,000
Weirton Steel Co. Division	14	3,300,000 (a)	2						3,300,000
TOTAL	31	7,000,000 (a)	4						7,000,000
Newport News Shipbuilding & Dry Dock Co.							3	15,000	15,000
Northwest Steel Rolling Mills, Inc.							2	53,000	53,000
Northstar Steel & Wire Co.							5	835,000	835,000
Oregon Steel Mills							3	150,000	150,000
Pacific State Steel Corp.	3	216,000							216,000
Pencoyd Steel & Forge Corp.							1	15,600	15,600
Pittsburgh Steel Co.									1,560,000
Porter Co., Inc., H. K.							5	225,000	225,000
Connors Steel Division							2	9,600	9,600
Vulcan Kidd Steel Division							6	234,600	234,600
TOTAL									
Republic Steel Corp.	80	9,794,000	3	529,000			23	2,419,000	13,742,000
Ronko Electric Steel Corp.							1	163,000	1,861,000
Sharon Steel Corp.	16	1,698,000					3	21,600	21,600
Simeona Saw & Steel Co.							2	66,000	66,000
Southern Electric Steel Co.							1	45,000	45,000
Southwest Steel Rolling Mills.							4	132,450	132,450
Tampa Roller Bearing Co.							9	780,000	780,000
Union Electric Steel Corp.							2	23,000	33,000
United States Steel Corp.									
(Central Operations)	177	37,657,000 (c)	8	864,000			10	462,000	28,963,000
American Steel & Wire Division	22	1,986,000							1,988,000
California Steel Division	19	3,112,000							3,112,000
National Tube Division	15	3,146,000	5	894,000					4,040,000
Tennessee Coal & Iron Division.	23	3,997,000 (a)	3						3,997,000
TOTAL	236	39,696,000	17	1,758,000			10	462,000	41,916,000
Universal-Cyclops Steel Corp.							10	77,410	77,410
Empire-Reeves Steel Corp.							10	30,000	30,000
TOTAL							6	42,000	42,000
Vanadium-Alloys Steel Co.									
Coleman Steel Co.									
TOTAL									
Waukegan Wire Co.	4	93,000							93,000
Western Rolling Mills Div.									
Yuba Consolidated Industries, Inc.									
Wheeling Steel Corp.	11	1,830,000	3	578,000					1,490,000
Wickwire Brothers, Inc.									
Youngstown Sheet and Tube Co.	61	6,750,000							6,750,000
TOTAL	920	126,526,380	31	3,577,000	1				

MEN IN METALWORKING



P. W. Norris, named president, Denison Engineering Div., American Brake Shoe Co., Columbus, O.

C. C. Jarchow, elected chairman of the board, American Steel Foundries; **J. B. Lanterman**, named president and chief executive officer.

T. H. Pearce, elected president, National-Standard Co., Niles, Mich.; **W. D. Peace** and **R. W. Elder**, elected vice presidents, respectively, for rubber industry sales and specialty sales; **K. D. Smith**, appointed special adviser on the rubber industry.

F. U. Hayes, appointed president and general manager, Sperry Products, Inc., Danbury, Conn.

L. G. Probst, named vice president and eastern district manager, National Engineering Co., Chicago.



J. P. Gaeth, appointed vice president and treasurer, The Osborn Mfg. Co., Cleveland.

R. C. Cole, named president, Vitro Uranium Co., Salt Lake City, Utah, a division of Vitro Corp. of America.

A. B. Comstock, Jr., named vice president, sales, Gary Screw and Bolt Div., Pittsburgh Screw & Bolt Corp.

J. K. Kuenzig, named superintendent, Brier Hill Coke Plant, Youngstown Sheet & Tube Co., Youngstown, O.

H. F. O'Shaughnessy, promoted to works manager, Chase Metal Works, Chase Brass & Copper Co., a subsidiary of Kennecott Copper Corp., Waterbury, Conn.

G. R. Gent, appointed manager, welding, brazing, and soldering product sales, Aluminum Co. of America, Pittsburgh.

G. H. Woodhouse, appointed assistant treasurer and manager, corporate insurance, Armco Steel Corp., Middletown, O.

W. M. George, appointed operations manager, Drop Forge Div., Duff-Norton Co., Pittsburgh.

R. E. Whittaker, Jr., appointed steel sales manager, A. M. Byers Co., Pittsburgh.



W. A. Baldwin, appointed vice president, transportation products sales, Stran-Steel Corp.

W. D. Mathers, named manager, forging sales, Aluminum Co. of America, Cleveland; **W. C. Woodward**, named manager, aircraft and missiles sales.

F. R. Morrow, appointed manager, industrial construction products sales, Kaiser Aluminum & Chemical Sales, Inc., Chicago.

J. R. Sally, appointed assistant manager, sales, Pipe Div., Republic Steel Corp.

H. E. Hobe, appointed chief en-



A. J. Chandler, appointed vice president, Brush Div., The Osborn Mfg. Co., Cleveland.



M. L. Mandeville, named vice president and director, sales, International Div., U. S. Industries, Inc.

Republic ELECTRUNITE Mechanical Tubing

...facilities and abilities save production time, materials, costs!

This story is a typical example of how Republic's ELECTRUNITE® Mechanical Tubing—in rounds, squares, rectangles, can work for you.

Syncro Corporation, Oxford, Michigan, manufactures quality jig saws for home workshops. Previously, they used a casting for the blade-yoke which requires a severe bend. ELECTRUNITE Square Tubing was recommended for one model, rectangular tubing for the other.

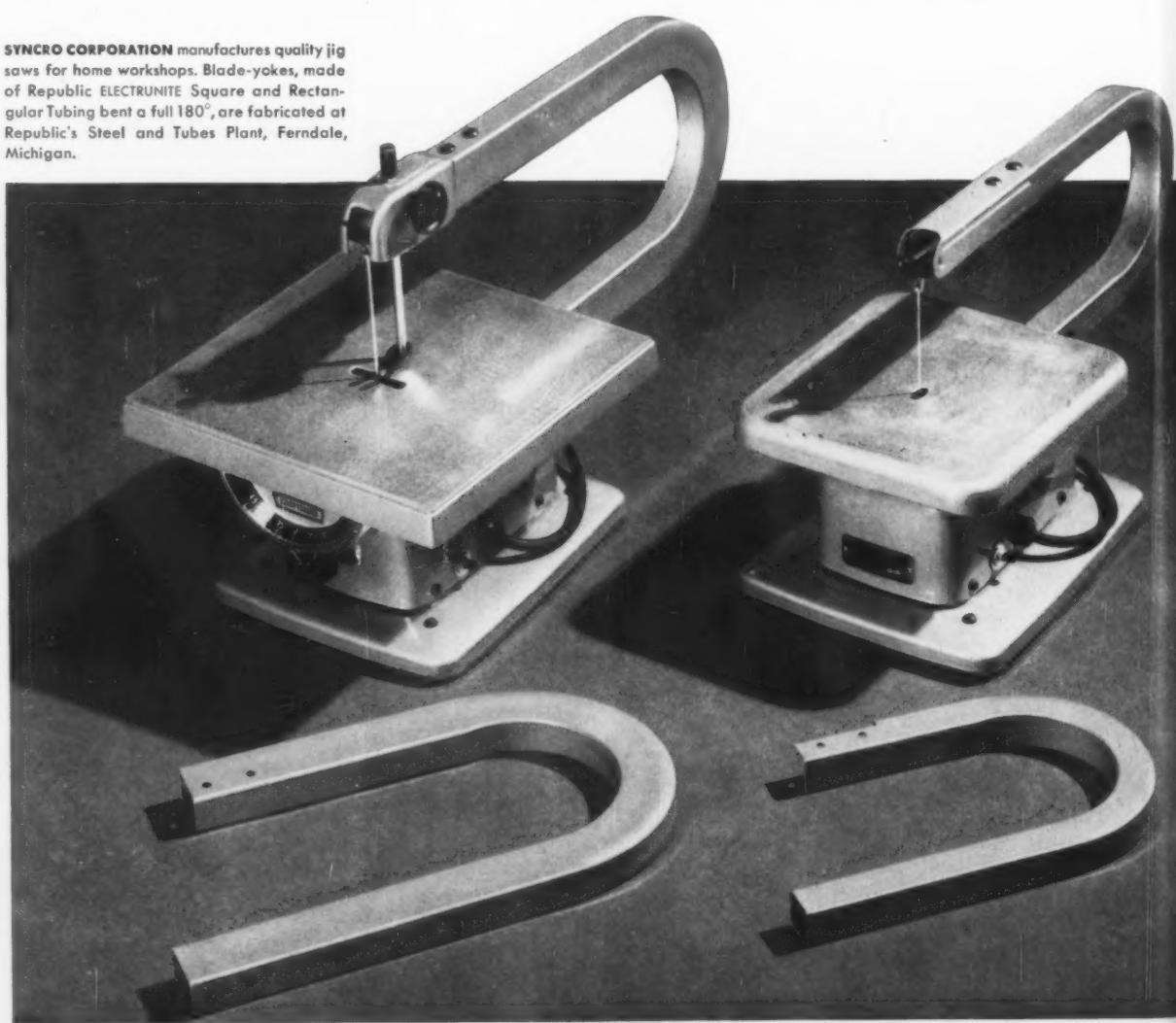
Results: Reduction of weight of the blade-yoke and improvement in the appearance of the product, at a savings in time, materials, assembly, and shipping costs.

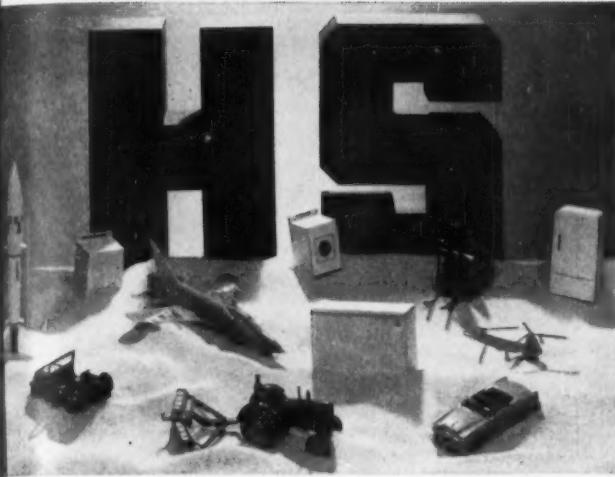
ELECTRUNITE solved this problem because Republic Mechanical Tubing is produced with the ability to withstand severe bending. In both models, ELECTRUNITE Mechanical Tubing is bent a full 180° without noticeable distortion or loss of strength.

Republic's Steel and Tubes Division has the facilities, equipment, and "know-how" to fabricate all grades and types of ELECTRUNITE carbon and stainless tubing into whatever shapes your product requires.

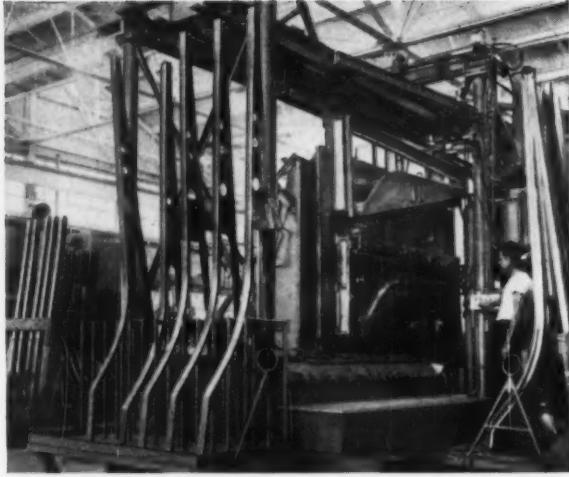
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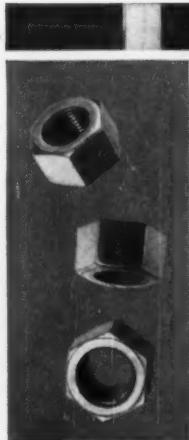


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the No. 1 choice is the V-belt with concave sides

It is easy to see why concave sides insure far longer belt life...and make Gates V-Belts the first choice of industry everywhere.

Just make this simple test: bend a Gates V-Belt as if it were going around a sheave. Feel how the concave sides (Fig. 1) fill out...become perfectly straight (Fig. 1-A).

Note how this belt thus makes full contact with the sides of a sheave...grips the sheave evenly, distributing wear uniformly across the sides of the belt. Uniform wear lengthens belt life—keeps costs down.

With a straight-sided belt (Fig. 2) the sides *bulge out* when the belt is bent, and wear is concentrated on the bulge (Fig. 2-A). Uneven wear shortens belt life—increases belt costs.

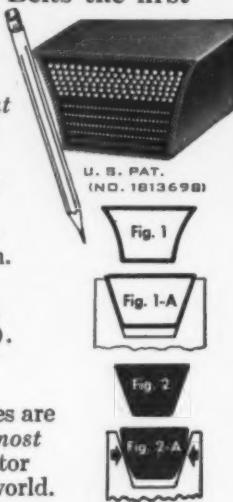
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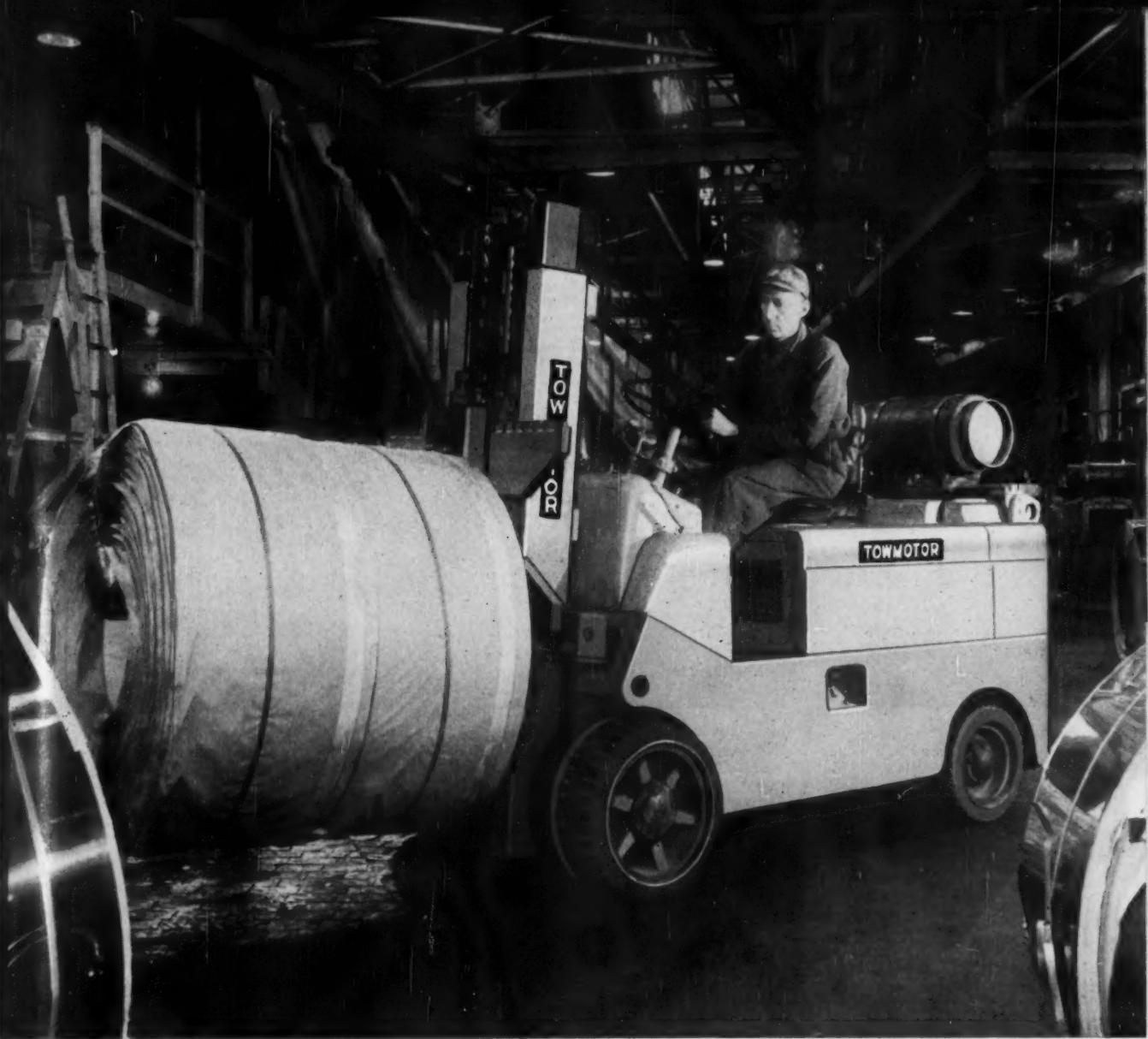
J. B. Knaebel, appointed president and managing director, Anaconda Iron Ore (Ontario) Ltd., a subsidiary of The Anaconda Co. (Canada) Ltd.



R. W. Frederick, appointed assistant to the president, Bridgeport Brass Co., Bridgeport, Conn.

P. E. Caron, named manager, By-Products Sales Dept., American Smelting & Refining Co.

Dr. N. B. Sommer, appointed manager, American Cyanamid Co.'s explosives and mining chemicals dept.; **G. C. Holton**, named assis-



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Top Tooling is a 3-way responsibility of a 3-Man Team: (1) Your Tool Engineer—who knows your customer's requirements and the job schedule. (2) Your machine operator—who knows the ability and limitations of the machine, and (3) Your Kennametal Carbide Engineer—who knows which carbides to use and how to apply them.



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Leading tool engineers agree that the metalworking industry has been losing thousands of dollars annually through improper tools and techniques. But today's business climate dictates a good hard look at loose production practices . . . large tool inventories, costly regrinding, less-than-possible output! It's time to TOP TOOL, which means to get the right tool on every job—on every machine in your line.

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Once a study has determined the best tooling for your operations, the comprehensive Kennametal line provides a performance-proved grade to meet the specific needs of every job.

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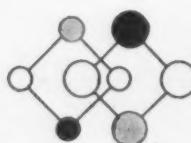
selection tailored for today's high alloy materials, closer tolerances, higher cutting speeds, and specialized operations.

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tant to the general manager, Organic Chemicals Division.



W. S. Whittaker, elected chairman, Executive Committee, Pratt & Whitney Company, Inc., West Hartford, Conn.

R. E. Mitchell, appointed plant manager, Dynamatic Div., Eaton Manufacturing Co.'s central industrial relations staff in Cleveland.

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N. A. Moore, appointed sales manager, Cincinnati territory, Columbia Tool Steel Co., Chicago Heights, Ill.

A. L. Kling, appointed director, Loss Prevention, Olin Mathieson Chemical Corp.



C. W. Elston, appointed general manager, Gas Turbine Dept., General Electric Co., Schenectady, N. Y.

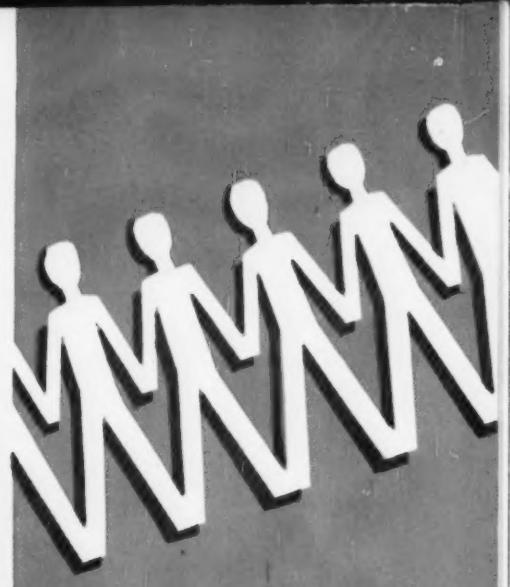


S. W. Off, appointed asst. manager, tin plate products, U. S. Steel Corp., Pittsburgh.

OBITUARIES

Van Winkle Todd, 66, chairman of the board, Hanson-Van Winkle-Munning Co., Matawan, N. J.

R. E. O'Brien, field secretary, American Institute of Mining, Metallurgical, and Petroleum Engineers.



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The full and complete Malleabrasive process itself—used by ourselves exclusively—provides a degree of uniformity unmatched in the metal abrasive field.

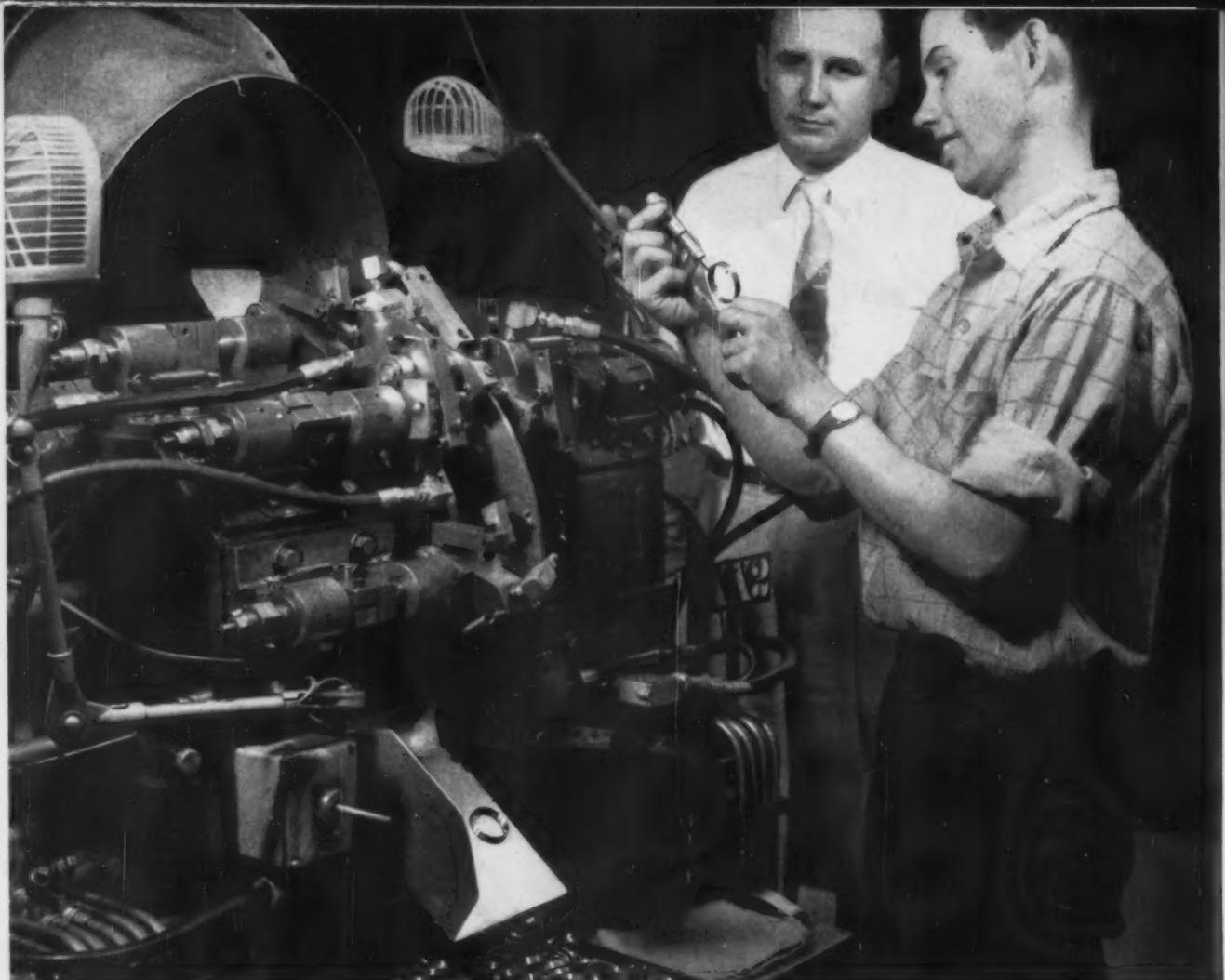
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MALLEABRASIVE



William Kody, American Coil Spring sales manager, watches as important product receives periodic check. An automobile window regulator clutch spring, it must be very precise. Johnson music spring wire fits product and machine.

Johnson Music Wire meets the test at American Coil Spring Company where . . .

Automation Demands Uniform High Quality

When American Coil Spring Company needed a precise music spring wire for an exacting auto window regulator spring, past experience prompted it to turn to Johnson Steel & Wire Company, a leading producer of high-carbon fine-specialty wires.

And when the same company—for 32 years one of the nation's top precision springmakers—was looking for ways to further automate its Muskegon, Mich., plant, Johnson came up with another answer—extra-sized coils of weld-free music wire to reduce machine downtime and wire handling.

One of the largest spring wire users in the United States, American Coil has a company watchword—*Springs With a Pedigree*. Everyone at American Coil lives up to this slogan by

constantly emphasizing quality in every phase of production. This has paid off for American Coil by building a reputation for making the best of standard springs—and special springs others can't make.

Every bit of American Coil's skill comes into play on the auto window regulator spring. The spring has to have perfect diameter because it is mechanically inserted in the window clutch during an automatic assembly. Too large, and the spring won't fit. Too small, and it will cause slippage when the window is raised or lowered. Either variation in dimension will cause rejection.

To make the spring, which has three turns and is close wound with extended legs bent opposite, American Coil in-

vented a special machine to combine the coiling and bending operations.

One-half of the challenge solved by the machine, American Coil then had to find a superior wire. Cast and peak had to be exactly as specified. Uniform dimension of .055" X-L-O music wire had to be held, both within the coil and from coil to coil. Excellent surface was another must. Johnson's X-L-O music wire met these specifications readily. It is available in a full range of sizes between .003" and .300" and can be given a number of phosphate or other surface coatings.

Meeting this customer's requirements through ingenuity and good wire is a formula American Coil applied in the case of the extra-sized coils.



Springs are periodically projected onto the screen of this shadowgraph so that minute details of their conformation are compared with drawings.

American Coil is committed to a policy of automating wherever possible. In springs requiring Johnson's .080" and larger music wire, Johnson doubled coil sizes from the traditional 250 pounds to 500 pounds without welds. This reduced storage space, simplified handling and reduced downtime on the coiling machines. Moves like this permit American Coil to achieve a daily capacity of 18 million pieces with a labor force that numbers usually 350 people.

Of the relationship between American Coil and Johnson, Works Engineer James Church of American Coil says:

"The combination of our experience in springmaking and Johnson's superior knowledge of wiremaking, results in a highly successful product."

All these advantages of Johnson's wire are available to you, no matter whether you need music wire or any of the other specialties—

Aircraft Cord Wire . . . Armature Binding Wire . . . Belt Hook Wire . . . Bobby Pin Wire . . . Brush Wire . . . Gutterbroom Wire . . . Card Wire . . . Shade Roller Wire . . . Flexible Shaft Wire . . . Heddle Wire . . . Hose Reinforcement Wire . . . Hose Wire . . . Mandolin Wire . . . Piano Wire . . . Rope Wire . . . Safety Pin Wire . . . Special Shaped Wire . . . Staple Wire . . . Metal Stitching Wire . . . Signal Corps Wire . . . MB Spring Wire . . . Tire Bead Wire.

If you have an application which requires high quality and close tolerances, Johnson is ready to serve you. Call your closest district office today.



Operator prepares for a run of springs for automatic bowling alley pin setters. The Johnson music spring wire

that feeds this machine comes in a special 500 lb. bundle so that run will be twice as long. Downtime is reduced.



Nobody watches this machine as it produces thousands of perfectly duplicated springs. If the wire were not highly accurate in dimension and metallurgical characteristics, frequent adjustments would be necessary.



Testing for tension is a constant operation at American Coil Spring. Variations in wire quality would show up here. American is well satisfied with Johnson music wire quality.

Johnson Steel & Wire Company, Inc.

Worcester 1, Massachusetts

a subsidiary of Pittsburgh Steel Company

Grant Building

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This is a Crack ... it cost \$10,000

You can't see this crack. Neither could the sharpest eyed inspector, without an effective test system. Yet this tiny crack was big enough to cause parts rejection later, that stopped production. Unfortunately, this only happened after an estimated \$10,000 had been wasted in useless finishing operations on the parts containing this crack.

Cracks like this and similar defects develop in all metal parts—under practically any fabrication or processing method. Simple economics make it too costly to gamble, when you can find these imperfections before they cost you money and disrupt manufacturing schedules.

If you would prevent such waste, Magnaflux offers you the most complete variety of highly developed nondestructive test systems.

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Zyglo for nonmagnetic and other materials . . .

Sonizon Ultrasonic Testing . . .

Stresscoat to find and measure stress areas . . .

Magnatest electronic testing for hardness, conductivity, cracks, etc. . . .

And many others

One or another of these Magnaflux Test Systems can improve and simplify your testing. Prices start at \$36.00, to save you money—and increase the productivity of your men and machines.

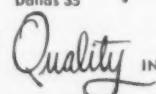
Ask to have your Magnaflux Engineer show you how . . . and *how easily*. As your nationwide "House of Answers" for testing, we maintain an extensive list of technical literature. Write and tell us of your problems or inspection aims. We'll send you facts and data most closely relating to your individual needs.



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IN NONDESTRUCTIVE TEST SYSTEMS

**Cracks have many causes
—find the cause and you'll
spotlight the cure—early**



**Grinding cracks as seen with Magnaglo.
In this case the result of wrong wheel.**



**Handling cracks in a grey iron casting,
as shown by Magnaglo. Here caused by
rough handling between pouring and
machining.**



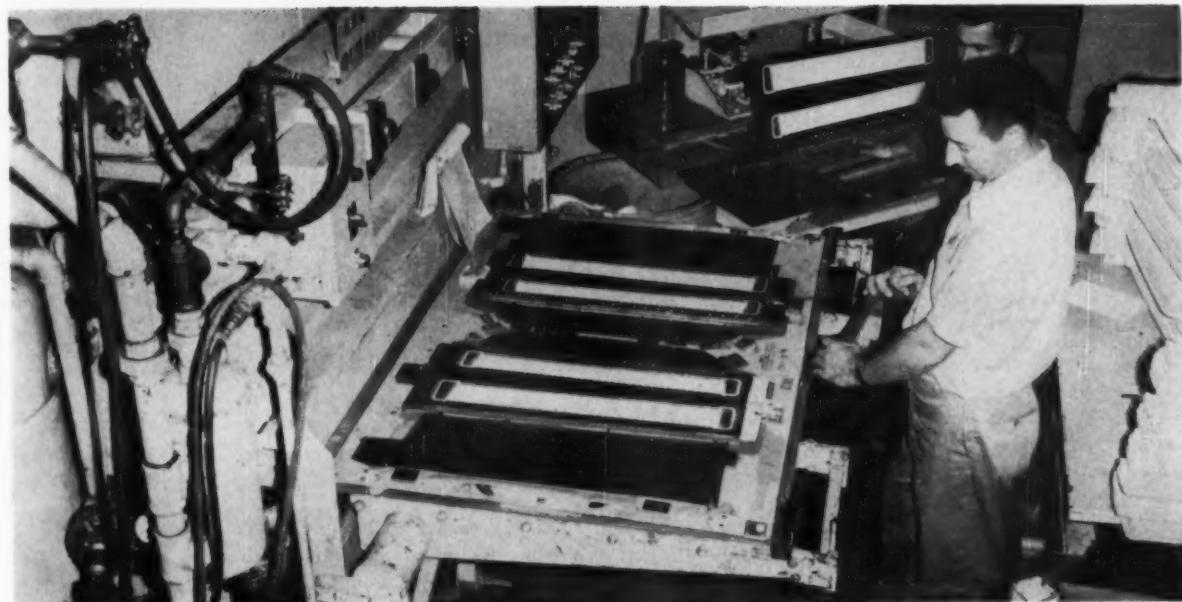
**Nonferrous inclusions found with
Magnaglo in a forged part after rough
machining. No time lost in finishing.**



**Shrink cracks in copper billet, sharply
revealed by Zyglo, prevented rolling into
defective bars.**



Grinding cracks in carbide tool. Detection by Zyglo avoided failure in use.



FAST HEAT: Auto body trim sandwich goes into dielectric press for 10-second bonding and design embossing.

Dielectric Press" Welds" Vinyl-Covered Sandwich Panels

A new technique uses dielectric heating to bond and emboss vinyl plastics. Developed for automotive trim, it shows promise for bonding and decorating a wide range of soft materials.

By R. H. Eshelman
Engineering Editor

■ A new manufacturing process—dielectric “welding”—is expanding the design possibilities of soft materials. New combination sandwiches, inlays and overlays, using vinyls, Mylar and other metallic coated plastics are now practical. Texturing and embossing are made relatively simple.

Although dielectric heating principles are not new, engineers at

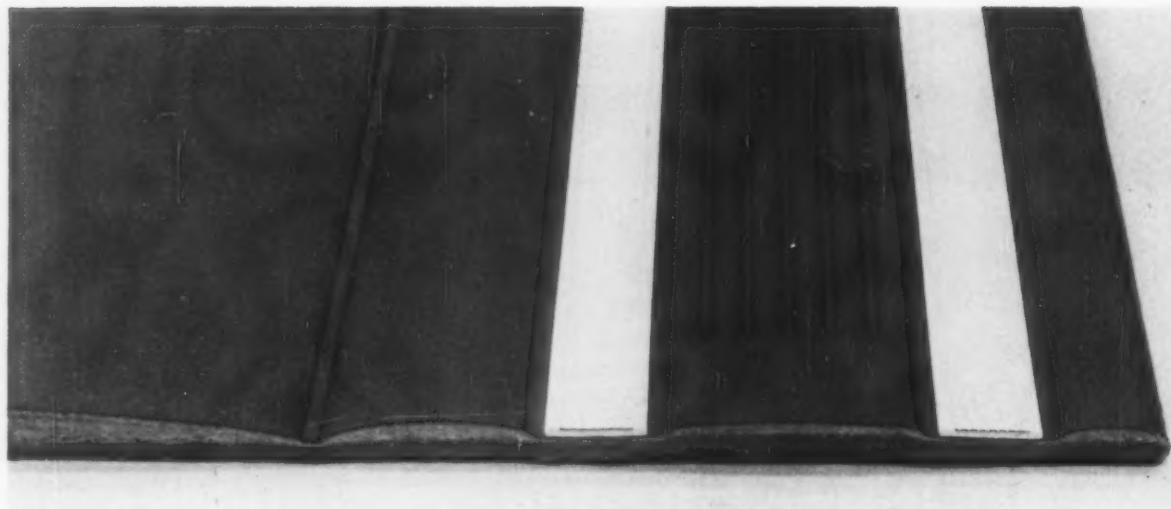
General Motors' Fisher Body Div. have developed improved techniques and equipment. Their interest lies in automotive interior trim and seating. This year there are many production applications, including: (1) embossing of vinyl plastics, (2) imprinting of medallions and geometric designs, (3) sealing of joints in upholstery material, (4) welding of contrasting color inlays to vinyl coated fabrics, and (5) sealing of convertible-top seams.

Robert E. Allen, engineer-in-charge of Fisher's development engineering, reports: “We believe this is a more flexible process than any other used to date for producing automotive trim.” Development engineers have tamed the tough pro-

duction problems of making the process work with foam rubber and felt.

How It Works—Dielectric processes, of course, depend on developing heat internally in an electrical insulating (on non-conducting) material. An electric field generates heat directly within the materials. In embossing, a sandwich of trim materials is placed between two metal plates in a dielectric press. Then an electric field is set up between the plates.

The two plates in the press are given opposite electrical charges. One plate is positive; the other negative. The oppositely charged plates set up electrical forces of attraction and repulsion. These forces cause movement of molecules



OVERLAY TRIM: One operation embosses and bonds this padded sandwich with metallized vinyl trim.

within the material (see below).

The molecules line up with their negative poles toward the positive embossing plate and their positive poles toward the negative plate. But the alignment is reversed rapidly by alternating current used to supply the electrical charge. It's the action of the molecules in the material, reversing or rotating, that heats the trim material.

High Frequency Needed—Since the amount of heat energy from one cycle is small, many cycles

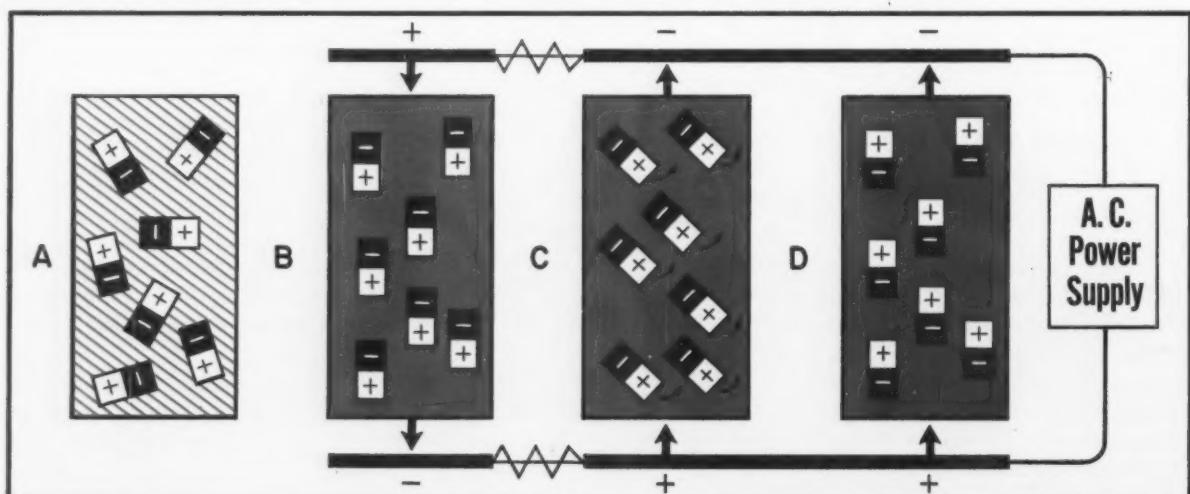
per second are needed. In Fisher Body's dielectric setup the frequency is 14 million cycles per second (megacycle range). Voltage may run as high as 4,000. The process can heat an adhesive, for example, to 325°F in about 10 seconds.

Equipment the firm has developed for dielectric processing has three elements: a power section, an oscillator section, and a work or tooling section. The power section converts low voltage, alternating current from plant supply lines into

high voltage, direct current. The oscillator changes this into high voltage, high frequency, alternating current (radio frequency).

Tooling Is Tricky—The work section converts the RF current into heat energy in the material. This work area lies between the lower and upper platens of an air or hydraulic press, which supplies needed pressure. Protective shielding avoids radio interference from the oscillator and also provides employee safety.

Molecules Dance as Current Alternates



MOLECULES IN MOTION: Molecules in non-conducting trim material (a) orient electrically when plates

are charged (b). Alternating current (c) and (d) agitates molecules to build up heat in the material.

A big part of the success of dielectric processes in production hinges on the tooling—platen and blades. New tooling is needed for each job. It must be designed for contour, and for the shape desired.

In operation, platens and blades are not heated, since they are metal and unaffected by the electric field. The blades do absorb some heat from the trim materials. When the dielectric heating is stopped, they quench and set the adhesive. This bonds the layers under the decorative lines, where the blades have pressed the layers together.

Materials Vary—"In developing a practical production process we've had to overcome many material problems," says Ralph M. Stallard, senior production engineer. He adds that it's been necessary to establish materials variables and set up dielectric specs for each job. They find wide differences in the

way materials respond to heating by the dielectric method. Molecules in some respond differently to the electrical charge than others.

Then too, they found important differences with frequency, temperature and humidity. Fisher's process development department explored effects of humidity on electrical properties of materials, especially. They recommend humidity control in production areas.

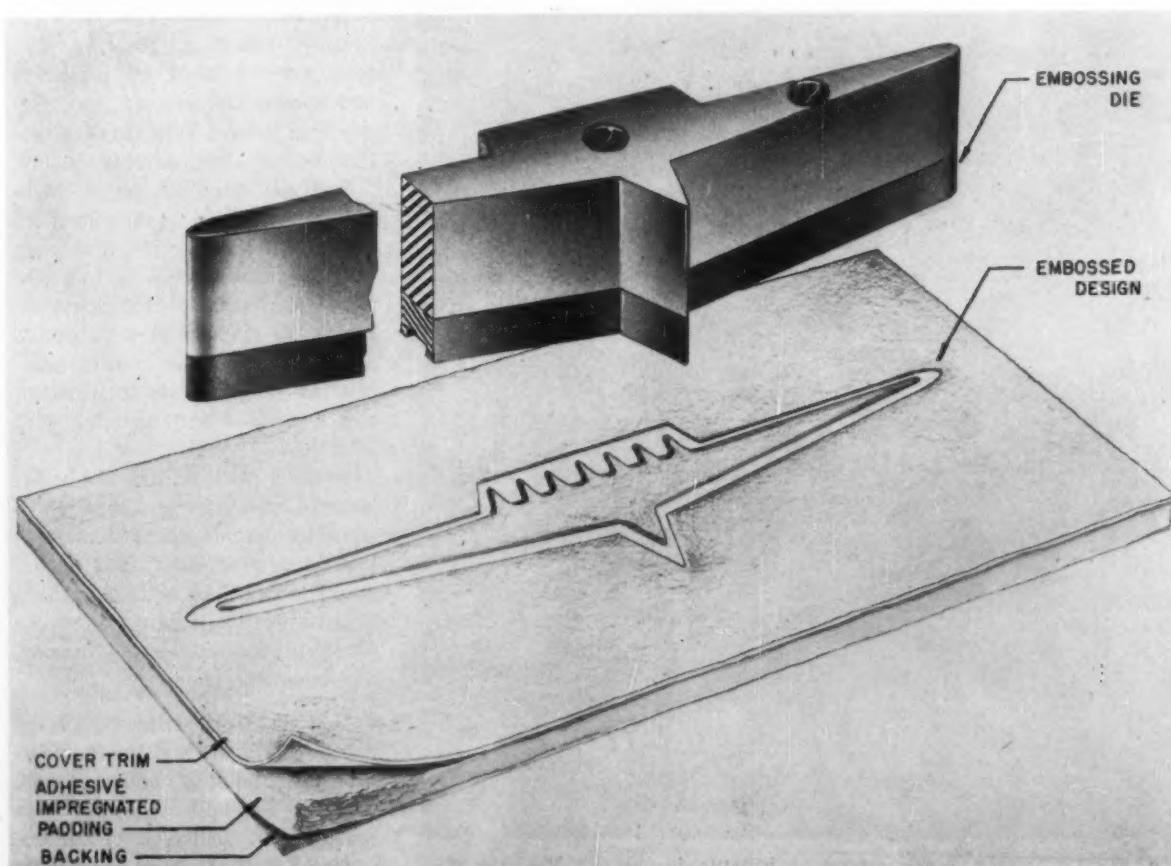
Excessively low humidity reduces the power factor and dielectric constant of materials. Most are hygroscopic and require higher embossing voltages. Excessively high humidity, however, often results in too much heat which blisters the vinyl coating.

Set New Specs—Even when their studies showed what characteristics a material should have for dielectric processing, it was often difficult to get them. For automotive trim,

many other physical properties had to be considered from the viewpoints of cost, processing and service. Some of these properties were in conflict with dielectric requirements.

Fisher Body engineers, say, however, that with the cooperation of suppliers they have licked most problems. One of these concerned the removal of residual salts and other ionizable substances left from bleaching and dyeing. These concentrated the ionization and caused localized overheating. Today, development engineers say that thermoplastics present no special problems in dielectric processing.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.



TRIM SANDWICH: Typical job embosses design while vinyl cover, padding, and backing are bonded.

Speed Missile Parts Output With Induction Heating

By L. C. Porter—Missile Systems Div., Raytheon Manufacturing Company, South Lowell, Mass.

Heating by induction tackles four jobs at once. It brazes, solders, sinters, and tempers vital missile parts.

But even with greatly increased production, quality is maintained at a very high level.

■ Versatility is often a key to economic advantage. When it comes to putting heat to work, it's one reason why so many metalworking plants have joined the swing to induction heating.

Perhaps induction heating's most

attractive feature is the unique adaptability of its heating coil. As working tools, such coils are usually small, simple to make, easy to handle, change, or relocate. But above all, they can tackle a wide variety of jobs.

Recently, Raytheon's Missile Systems Div., South Lowell, Mass., came up with a multi-station induction heating setup that proves that a whale of a lot of heating jobs can be handled by just one type of equipment.

Four Operations—Tied in with proper controls, this automatic, four-station setup takes care of brazing, soldering, sintering, and tempering. Control of protective atmosphere, temperature, and heating time insures both product uniformity and a high level of quality.

Heat is supplied by a high-frequency induction unit with a 7.5 kw capacity. Power is fed through low-loss lines to coils at four stations on a specially designed work table. The kinds of parts processed are delicate, missile-control components—a gyroscope compensator and a bellows and metering plug assembly.

At each work station, the power level is pre-set by a control rheostat. This permits independent, stepless adjustment from zero to full power input. Glass bell jars provide a covering for controlled atmospheres needed in soldering, brazing, and other operations.

Delicate Work—Because of the delicate parts involved and the nearness of one joint to another, special fixturing is required in the gyro brazing and soldering operations.

Here's a rundown on how these assemblies are processed. With the



CLOSE CONTROL: Gyro compensator is fixtured in bell jar. With the press of a button, parts are silver brazed at 1300°F in two minutes.



MULTI-STATION: A variety of operations can be set up at four separate stations. Individual control panels

are located beside each operator. Heat is supplied by a high-frequency induction unit with 7.5 kw output.

bell jar raised, the operator first loads a part in the fixture. A "start" button lowers the bell jar and, at the bottom of the stroke, feeds nitrogen into the jar for a pre-set time. A fixed amount of hydrogen is also introduced.

A special safety feature takes care of the hazards of working with hydrogen. A solenoid valve in the nitrogen gas line is normally open. The hydrogen line is normally closed. In the event of power failure, hydrogen gas supply shuts off and the system purges automatically.

All Automatic — The induction heating cycle is turned on and off by a controlled timer. When the power is turned on, the control circuit to an air cylinder is closed and the bell jar is purged with nitrogen. Precise control of heating time, inert gas purge, and hydrogen gas flow is provided between each operational phase. Work can be handled in

sequence, with delay between, or can be phased to overlay each job.

Multiple processing on a single part demonstrates how the system covers various steps. To induction solder the terminals in the pickoff housing of a gyro, parts are assembled on a work table and placed in a fixture. Gas, heat, and other variables are then automatically programmed by the equipment.

Much Faster — When processing begins, fourteen terminals of the gyro part are soldered at once at 400°F in a controlled atmosphere. The job takes 10 seconds. The new technique increases reliability, reduces operator fatigue, and greatly cuts down rejection rate.

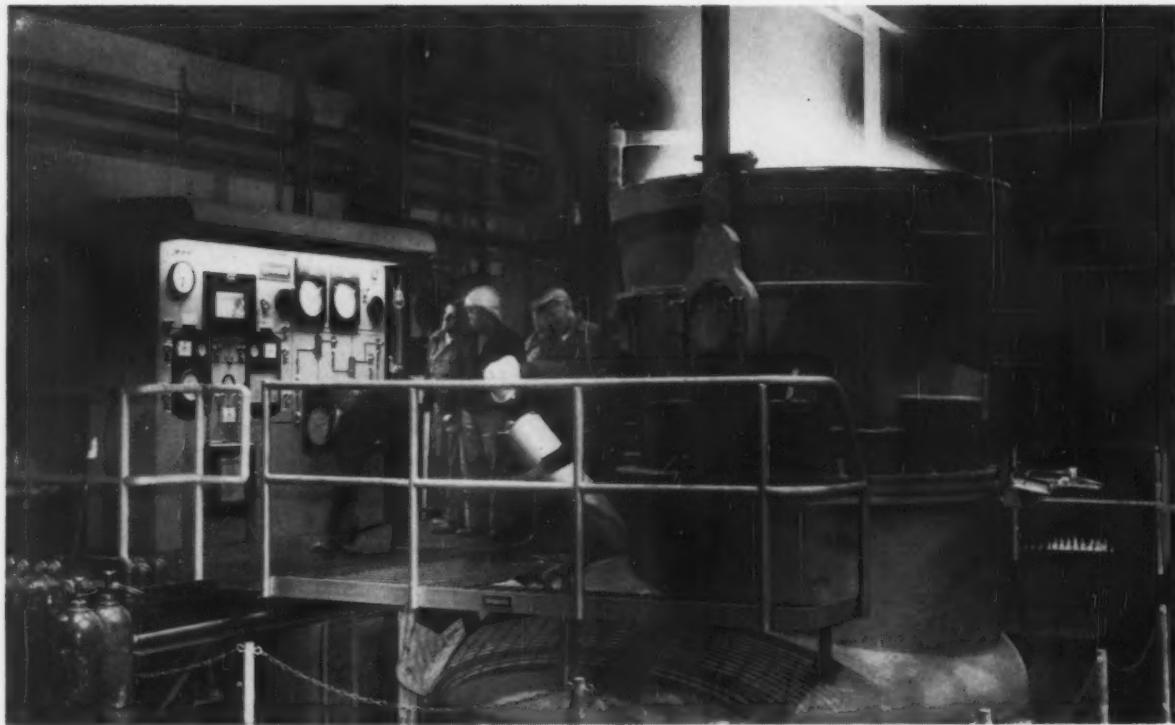
The system is sufficiently flexible to permit different operations to take place at the same time. For example, it is possible to silver braze in hydrogen at one station. At the same time, a soft soldering

can be handled at another station.

All setups are interchangeable at each station. But if desired, all stations may be put to work to produce the same part. Such flexibility makes it possible to meet high production requirements for short or long runs.

More Advantages — Another nice feature: complete change-over from one job to another can be accomplished in 2 or 3 minutes. Operating temperature ranges can be varied from 90°F to more than 5000°F.

Another important feature of the installation is the use of a potentiometer-type chart recorder to keep track of all work sequences at each station. The temperature at each station is reported by four heat-sensitive elements focused on the work in the bell jars. These temperatures, the delay between pieces, the number of pieces, and other information are all automatically recorded.



CLOSE WATCH: As molten steel pours into degassing chamber, melt foreman watches through a viewing port.

New Vacuum Stream-Degasser Yields Quality Steels

Vacuum stream-degassing capacity is further enlarged by a new installation that incorporates latest improvements.

Among other features, this setup eliminates the pony ladle and boosts efficiency to a new high.

The sixth vacuum stream-degassing installation in the U. S. is now in production at Standard Steel Works Div., Burnham, Pa., of Baldwin - Lima - Hamilton Corp. It provides a new source for quality steels used in rings and forgings operating at high-stress levels.

These steels are specially made with a very low hydrogen content. They are normally used in critical

applications where failure could be disastrous. High-speed turbine rotor forgings are a typical application.

The new degassing equipment at Standard Steel can handle the division's total electric furnace output. It has a 16-ton pouring capacity.

Demand Grows—The greatly expanded use of high-speed rotating machinery with heavily stressed parts has produced a vast upsurge in demand for vacuum-processed steels. It has also encouraged the development of a number of new methods and facilities for degassing.

Stream degassing is possibly the most successful and least expensive means of removing hydrogen from

large quantities of steel in a single pouring operation. Two other methods—induction melting and consumable-arc remelting—are also widely used. But they are primarily intended for the production of ingots of limited size.

Stream degassing provides refined steel in tonnage quantities by exposing the molten metal to a high vacuum as it pours in a continuous stream from the ladle into an ingot mold. The stream is literally torn apart by the vacuum, and gas is removed from the droplets of molten metal. There is progressive exposure of enormous surface area to the vacuum, resulting in the elimination of a high percentage of entrapped gases.



TOP VIEW: When poured metal reaches hot top level, explosive gases are diluted to a safe mixture with nitrogen.

For Better Steels—When a heat of steel is vacuum stream-degassed, at least six important improvements are attained. Hydrogen and oxide inclusions are reduced to a low level. Both oxygen and nitrogen contents are lowered appreciably. Ductility is increased. With lowered gas content, susceptibility to unwanted aging effects is reduced. Mechanical properties — such as tensile and yield strengths—are improved in both longitudinal and transverse directions.

Among other advantages, Standard's chief metallurgist, P. A. Archibald, finds that "in certain applications involving large masses of special compositions, heat-treating cost may be reduced by as much as 30 pct. In some instances, heat treatments are eliminated entirely and the product of a degassed ingot can be cooled completely in air without any flaking."

Change Emphasis—Also important is the fact that, in the future, heat treating of degassed steel will be used less and less to remove hydrogen and reduce flaking. Em-

phasis in heat treating will be almost exclusively concerned with developing the best possible mechanical properties.

Manufactured and installed by F. J. Stokes Corp., Philadelphia, the new degassing equipment can produce ingots up to 47 in., weighing 16 tons. In addition to ingot applications, Standard is also exploring the use of degassed steel for castings. The feasibility of degassing some acid open hearth steels is being checked.

A relatively complex operation, the making of a satisfactorily degassed ingot requires considerable "know how." Cleanliness of equipment is an important factor. Affected parts and equipment must be clean and dry. Special attention is paid to the ladle and ingot mold.

Control Vacuum—First, the vacuum chamber is evacuated to a starting pressure of about 150 microns. After the electric furnace is tapped, the filled pouring ladle is spotted above the degassing chamber. At this point, pressure in the system is equalized.

Then pouring begins. As the molten steel sprays down, there is an immediate pressure surge. This subsides in a second or two, and pouring continues at a pressure level of 200-300 microns.

When the level of molten steel reaches the hot top of the ingot mold, nitrogen is bled into the system. This is a safety measure which serves to dilute the explosive gases (hydrogen and methane) present. Undiluted, these could explode if there was any air leak in the system.

No Pony—With the pouring of the hot top completed, the system is brought down to atmospheric pressure. The ladle and vacuum container are removed from the stand. The ingot cools for several hours until it is ready for stripping and transfer to the forge shop.

Standard's equipment is probably the first to eliminate the use of an intermediate pony ladle in the pouring operation. Steel is ladled only once. The ladle which takes the molten metal from the furnace also pours it into the degassing chamber.

Can Fe-Cr-Al Alloys Ever Replace Stainless?

Credit the practical virtues of Fe-Cr-Al alloys with keeping research into these materials very much alive.

Their corrosion resistance is a major selling point, but they also offer promising mechanical properties.

By P. M. Unterweiser
Metallurgical Editor

■ Before vacuum melting became a practical reality, interest in Fe-Cr-Al alloys plodded along at an academic level. Such was the case for many years, largely because these alloys (with their dross-forming tendencies) were extremely difficult to melt and cast in air.

Now that vacuum melting is relatively commonplace, the picture shows signs of change. A number of fundamental research programs have been re-exploring older alloys,

developing new ones as possible substitutes for ferritic stainless grades as well as for their own intrinsic value.

Key Points—Behind this renewed interest is the knowledge that: (1) iron is the most abundant and cheapest metal on which to build a high-temperature alloy, (2) aluminum is also abundant, fairly inexpensive, and very effective in making iron alloys corrosion resistant, and (3) chromium is the key to corrosion resistance in stainless steels. Combined, these factors offer an attractive potential.

In the lab, at least, the potential has been recognized from the outset. But what progress is being made toward its realization?

Two recent technical reports may be offered in evidence. The first, issued by J. E. Srawley of the Naval Research Laboratory,¹ strongly endorses one class of Fe-Cr-Al alloys for a special type of chemical cor-

rosion—that resulting from the combustion products of residual fuel oils (so-called vanadium pentoxide attack). "No other alloys," according to Srawley, "are known to the writer to have shown better resistance in comparable tests. . . ."

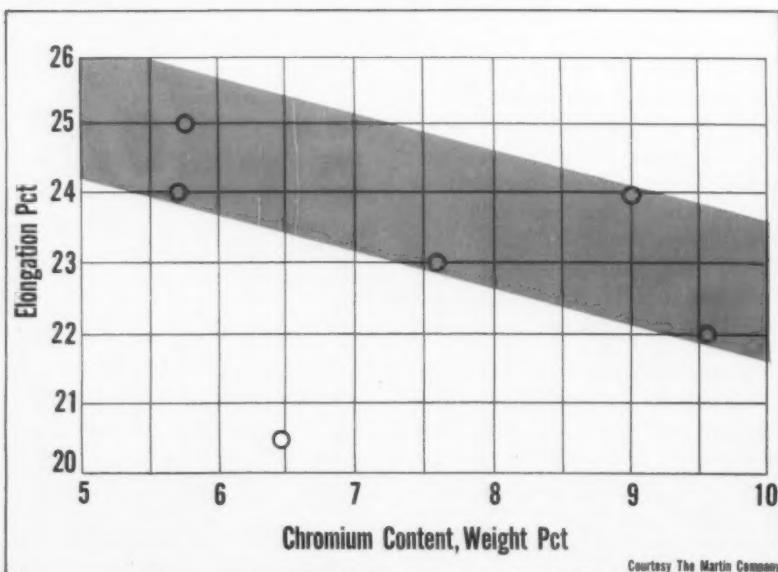
Alloy Groups—The Naval Research program covered two classes of alloys. A high-chromium group contained 23-26 pct Cr and aluminum ranging from 3 to 10 pct. A low-chromium group averaged about 10 pct Cr with almost equal percentages of aluminum. Alloys containing about 5 pct Al and 25 pct Cr provided the best resistance to "pentoxide" corrosion.

Of broader interest is a group of alloys of even lower alloy content. These have been investigated by The Martin Company, Baltimore.² They contain roughly 4 to 6 pct Al and only 6 to 10 pct Cr, with a minor addition of titanium. At least one alloy in this group combines both the corrosion resistance and mechanical properties of Type 430 stainless.

Melting Practice—The Navy report makes a valuable contribution to the technique of vacuum-induction melting these alloys. It concludes that (aside from other factors), "vacuum melting is justified for the production of iron-chromium-aluminum alloys because of the improvement in quality that results from the absence of air."

"The question of removal of nitrogen and carbon during heating needs further investigation. But apart from these and hydrogen, which is assumed to be removed to the practical limit, control of composition is determined by selection of raw materials. In particular, the dissolved oxygen in the final alloy is not susceptible to effective con-

Chromium vs Elongation



trol during vacuum melting. The nonmetallic inclusion content is probably best controlled by the oxygen content of the charge."

Brittle Side—The chemistry of some of the test alloys is shown in Table 1. Of those shown, only 51 and 52 had any appreciable ductility at room temperature. Characteristically, most of these materials were on the brittle side. But at temperatures from 1000° to 1600°F all of these NRL alloys take on a very high ductility and a low tensile strength as compared to materials normally used in this range.

In severe oxidation tests at 1800°F for 100 days, such alloys as 51, 52, and 60 oxidized less than half as much as a ferritic stainless (25 pct Cr) grade. Srawley concludes that "at higher temperatures the difference in oxidation resistance between the aluminum-containing alloys and the plain chromium alloy would be more marked." One possible advantage of the stainless alloy: it was not crack-sensitive; the aluminum-containing alloys were.

Resist Corrosion—In resisting residual fuel oil attack (especially fuels with a high vanadium content) at 1600° and 1700°F, the alloys with aluminum were obviously at their best. Under these extreme conditions, an alloy such as 39 (23.5 pct Cr, 9.4 pct Al) proved to be more than twice as corrosion resistant as Type 310, an austenitic stainless.

As for hot strength, the NRL tests showed that all the aluminum-containing alloys "had considerably better strength at elevated temperatures than the plain 25 pct Cr comparison alloy." Another conclusion: "high-temperature strength is increased at a given level of aluminum by an increase in chromium or by addition of titanium."

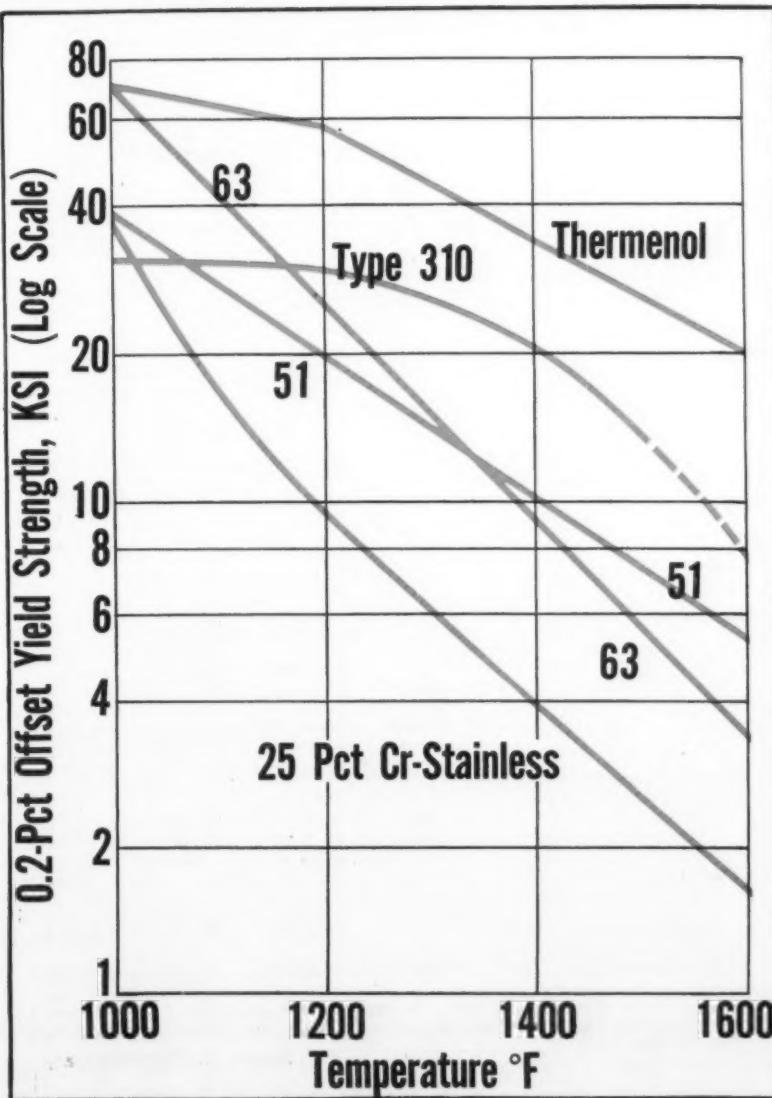
One alloy tested in the Martin program contained 5.5 pct Al and 9.5 pct Cr. Judging from the data in Table 2, the properties of this material are generally comparable to those of a Type 430 stainless. Its

TABLE 1: NRL Test Alloy Compositions, Weight Pct.

Alloy No.	Cr	Al	Ti	C	Mn	Si	P	S	O	N
34	25.2	5.0	•	0.04	0.08	0.008	0.009	0.008	0.0019	0.0007
39	23.5	9.4	•	(0.01)**	0.08	0.002	0.008	0.008	0.0012	0.0004
48	24.8	3.4	•	(0.01)	0.08	0.004	0.009	0.008	0.001	0.0028
51	25.9	6.0	•	(0.01)	0.13	(0.02)	0.022	0.013	0.0013	0.0082
52	26.1	3.8	•	(0.01)	0.13	(0.02)	0.020	0.013	0.0007	0.0011
60	10.5	11.1	0.55	(0.02)	0.08	(0.02)	0.002	0.004	0.002	0.0003
61	9.8	10.6	0.01	(0.01)	0.07	(0.02)	0.000	0.004	0.002	0.0002
63	9.9	10.9	1.38	0.08	0.08	(0.02)	0.000	0.001	•	•

* Not determined.

Hot Strength of NRL Alloys



Cup Test Ductility

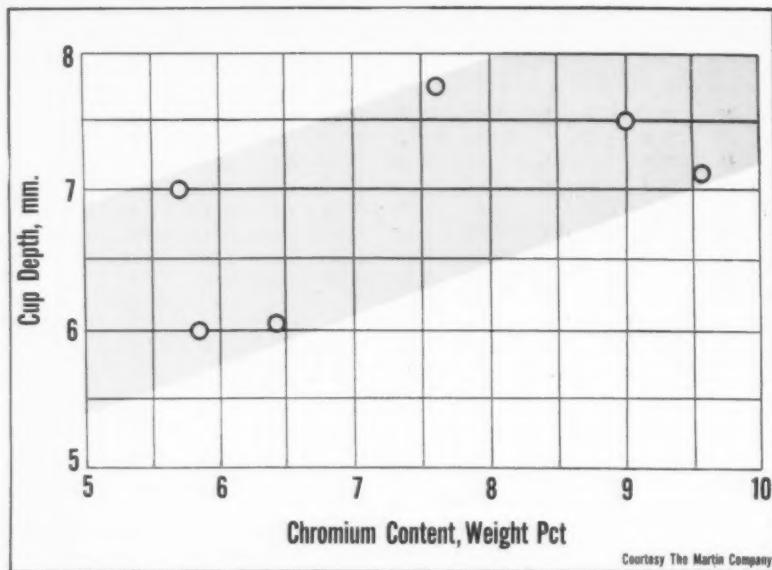


TABLE 2: 5.5 pct Al—9.5 pct Cr Alloy Data

	Experimental Alloy ^a	AISI Type 430
Yield Strength (0.2 Pct offset), psi		
Annealed	64,000	35,000 min. ^b
30% cold worked	108,400	—
Ultimate tensile strength, psi		
Annealed	82,900	70,000 min. ^b
30% cold worked	109,450	—
Elongation in 2 in., Pct		
Annealed	22.0	20 min. ^b
30% cold worked	4.0	—
Erichsen Cup Depth, (Annealed)	7.2	7-9 ^b
Minimum Bend Radius (Annealed)	1/2 T	1/2 T ^b

^aMartin Company test data - 0.030-0.040 in. sheet. ^bASTM A 176-54.
^cAISI Steel Products Manual.

Source: The Martin Company

TABLE 3: 7.5 pct Al—5 pct Cr Alloy Data

	Experimental Alloy (sheet stock specimens) ^a	Type 446 Stainless Steel (wrought bar specimens)	Type 316 Stainless Steel (wrought bar specimens)	Thermanol, 16 w/o Al, 3.3 w/o Mo (sheet stock specimens)
Room Temperature Properties				
Yield Strength (0.2 Pct offset), psi	60,000	51,500 ^c	38,500 ^c	—
Ultimate tensile strength, psi	87,500	83,000 ^c	85,500 ^c	129,000 ^c
Elongation in 2 in., Pct	24	25	60	10.5 ^c
Properties at 1500° F				
Yield strength (0.2 Pct offset), psi	5,000	3,500 ^c	18,500 ^c	—
Ultimate tensile strength, psi	11,000	8,000 ^c	27,500 ^c	23,000 ^d
Stress to Produce Rupture in 1000 hours at 1500° F, psi	1,000	1,100 ^b	7,000 ^b	1,000 ^a

^aMartin Company test data. ^bMetals Handbook, 1948. ^cReference 7.
^dInterpolated from data in Reference 9. ^eUnited States Steel Corporation Publication, ADV-18566 (S).

Source: The Martin Company

resistance to salt-spray corrosion is somewhat less than that of the stainless grade, and it has a pronounced tendency to work harden.

Better Drawability—With alloys of low aluminum content, chromium appears to have a complex effect on ductility. The curves shown plot the effect of chromium content on both tensile-test and Erichsen cup test ductility. Tensile ductility is lowered with increasing chromium. At the same time, deep-drawing characteristics (as measured by the cup test)—show definite improvement.

Another alloy in the Martin program contained 7.5 pct Al and 5 pct Cr with small additions of minor alloying elements. The primary objective in developing this material was to obtain sufficient ductility for cladding nuclear reactor components. High-temperature properties were not emphasized.

Nonetheless, this alloy shows promise of a broader potential. Key mechanical properties are compared with those of competing materials in Table 3. All of these values apply to material in the annealed condition.

Welding Methods—This alloy also has excellent oxidation resistance. But in common with the 9.5 pct Cr alloy, it cannot be satisfactorily fusion-welded. Such welding results in a coarse, brittle structure. Resistance welds, according to the Martin report, "particularly those made without producing a molten 'nugget' are strong and ductile."

The company also claims "considerable success in hot-roll bonding" this alloy "to other materials, including some of the high-hot-strength alloys."

REFERENCES:

- J. E. Srawley, "Iron-Chromium-Aluminum Alloys," NRL Report 5124 (1958).
- King, Mueller, Ida, and Tate, "Iron-Aluminum Base Alloys—Cheap Stainless of the Future?" SAE Preprint 608 (1958).

Rubber Bonds Flexible Insert

Rubber plays a dual role in replacing springs in a jaw insert: It provides flexibility. It bonds the jaw end to the base.

■ A new rubber-to-metal bond simplifies the design of the chuck of a pipe-threading machine. The flexible rubber connection between chuck jaw body and the gripping part of the jaw serves as a self-energizing grip.

Made by The Oster Mfg. Co., Cleveland, the chucks have three jaws 120° apart, moved in and out radially by turning a handwheel. The design eliminates the need for slamming the handwheel to establish a grip on a pipe.

Specify Rubber — In designing the new chuck jaw, Oster decided to do away with springs. It eliminates machining of complex shapes for housing springs. There's no cavity for coolant or chips to collect in. Jaws can be smaller and simpler.

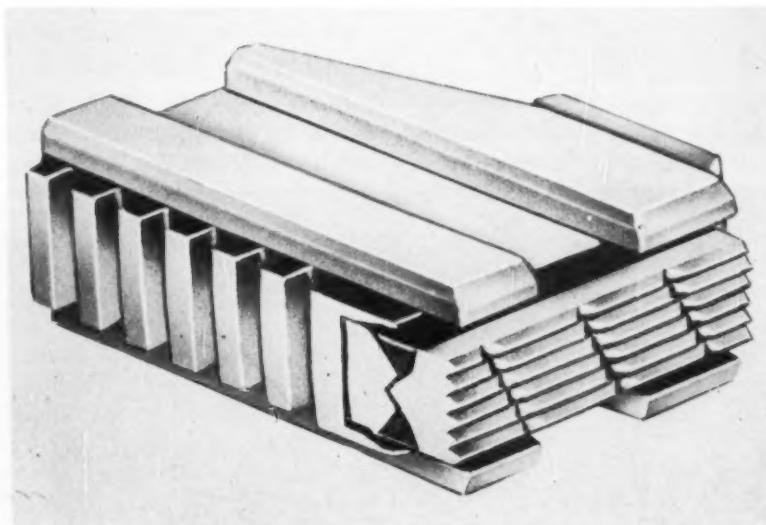
Replacing the spring design is an assembly with jaw ends and bodies joined by rubber. Processing the jaws, The Ohio Rubber Co., Willoughby, O., bonds the rubber to metal with only 1.53-in. bond area.

With a total amount of rubber in each piece of only 0.003 lb, Ohio Rubber formulated a special Neoprene compound for the job.

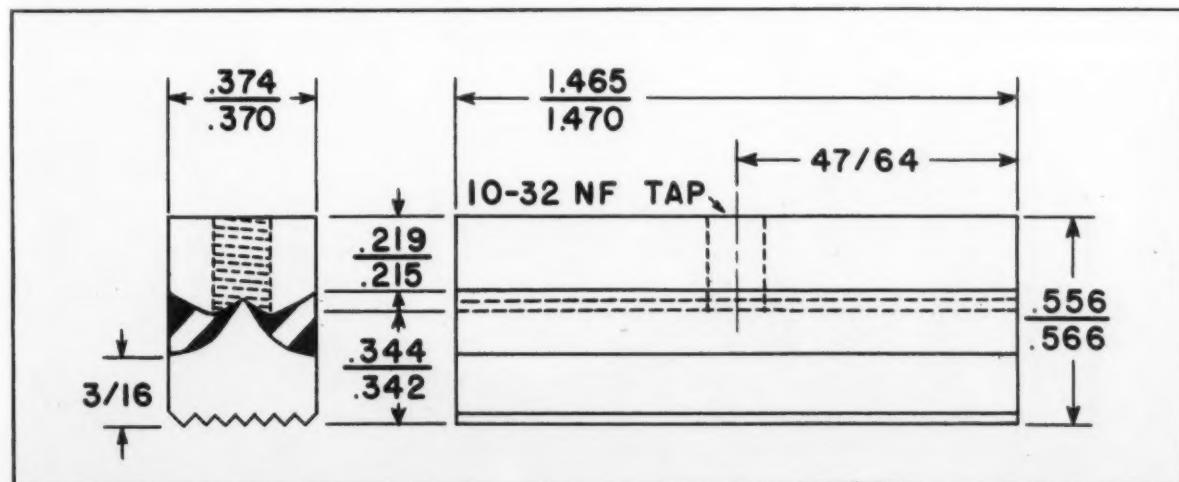
Stands Rough Service — Important factors are adhesion qualities, resistance to oils in threading compounds, and ability to retain strength and flexibility over a wide temperature range. The rubber has a Durometer hardness of 40.

Oster machines the pieces from tool steel and heat treats them to 55-57 Rc. Ohio Rubber then cleans them and inserts plugs in the tapped holes to prevent entry of rubber during molding.

A precision mold holds the parts during cementing. Heat and pressure complete the bond between steel and rubber. An accuracy of ± 0.005 in. is maintained.



RUBBER REPLACES SPRING: Flexibility of rubber allows serrated gripping surface to rock tight, then return neutral on release of grip.



RUBBER FORMS BOND: Heavy cross-hatched area in end view is extruded rubber, bonding jaw body to

jaw end. Set screw attaches insert to chuck jaw. Rubber and bond stand up to rough service conditions.

New Method Speeds Machining Of Honeycomb Core Material

Interrupted arcing, at the rate of 2500 per second, is the basis of this fast new way to machine honeycomb structures.

■ A new high-speed process for machining honeycomb cores of stainless steel or aluminum works 12 to 30 times faster than electrolytic machining. It's also said to be faster than cutting with a rotating blade.

Developed by Anocut Engineering Co., Chicago, the new technique does not remove metal by electrolysis or "deplating." Instead, a series of arcs or sparks of short duration

do the machining.

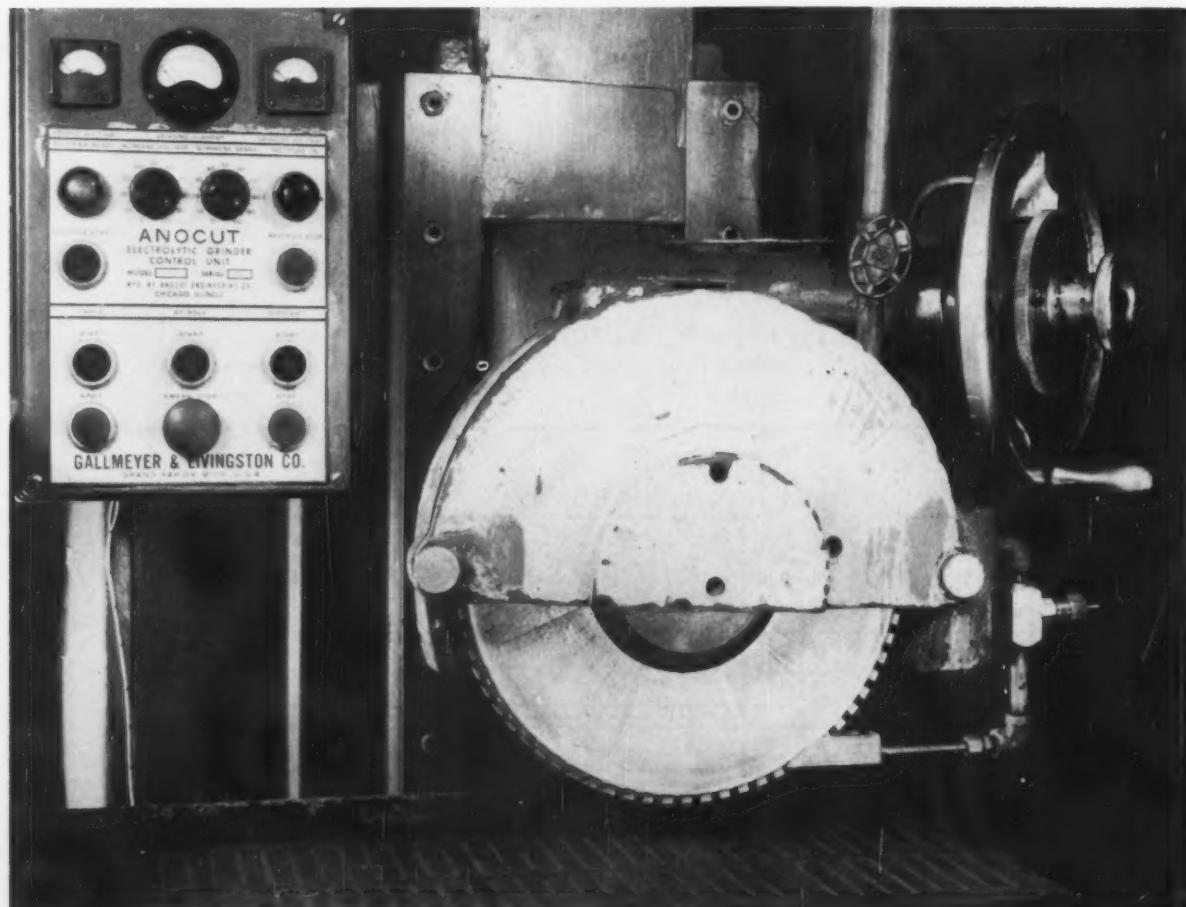
A metal wheel, used as an electrode, has a number of grooves cut into its rim at specified intervals. These grooves are both wide and deep enough to assure that the arcs struck between the working segments of the wheel and the honeycomb foil will be short lived. Wheel speed is regulated so that about 2500 arcs are struck and extinguished every second.

Needs a Coolant — This interrupted arc technique works fastest and best with a coolant. Dry cutting generates too much heat, the com-

pany says. Water helps, but for best results, Anocut recommends its special electrolyte solution.

The company tested its new process thoroughly, using the same power supply unit that goes into its Model 1000 electrolytic-machining equipment.

On stainless honeycomb core ($\frac{1}{4}$ in. cell size made with 0.0015-in. thick foil), the new process removed metal to a depth of 0.060 in. at a rate of 30 fpm. Width of the cut was 0.65 in. The machined surface checked out flat to within 0.001 TIR, and it was also substantially



SIMPLE SETUP: Putting the serrated wheel on this electrolytic surface grinder equips it for interrupted-arc

machining of honeycomb material. Groove width and depth prevents continuous arcing as wheel revolves.

burr-free. Microscopic examination, however, showed evidence of globular deposits which indicated some remelting of the steel.

Aluminum Didn't Melt—On aluminum honeycomb core, also of $\frac{1}{4}$ in. cell size but of 0.002-in. thick foil section, tests of the new method achieved the same removal rate. Runs were also made at a depth of $\frac{1}{2}$ in. and a speed of 10 fpm. None of these machined sections showed any visible evidence of remelted material, but a full metallurgical investigation has not yet been made.

Anocut contrasts the 30-fpm speed and 0.060-in. cut depth of the new process with the 2 to 5-fpm speed and cut depth of 0.030 in. normally achieved in production by "true electrolytic machining." On this basis, interrupted-arc machining is 12 to 30 times faster. Moreover, the metallic-wheel electrodes used with the new process cost less than the abrasive-bearing wheels used in electrolytic machining.

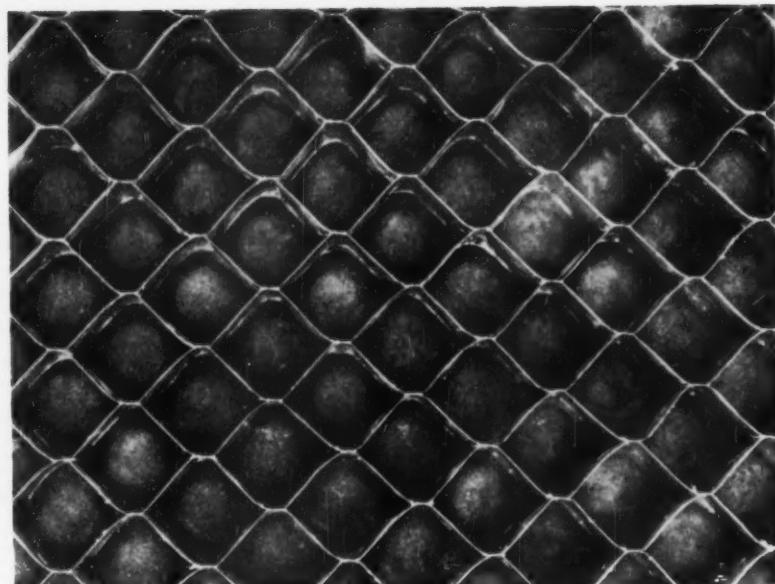
Has Its Limitations—Despite the speed of the interrupted-arc method, it isn't perfect to the point where it can take over the whole job of machining honeycomb structures. Anocut admits it has some disadvantages and limitations.

For example, the process creates some degree of localized heating. This may cause thermal damage to the honeycomb material, and particularly to stainless steel structures.

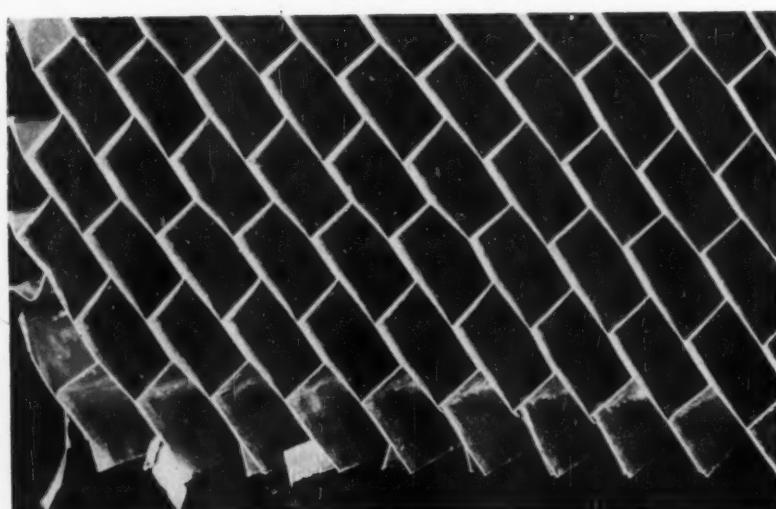
Corrosion Mystery — A subtle form of this thermal damage has been noted in 17-7PH stainless, which showed marked corrosion along the machined edges when it was put through salt spray tests. Why this happened isn't clear, since microscopic examinations and X-ray diffraction tests showed no change in the metal structure.

By contrast, this alloy showed no evidence of corrosion after it was machined electrolytically, and given the same salt spray test.

Because of this corrosion phenomenon, Anocut recommends using the interrupted-arc process for roughing only. For finishing cuts, the company suggests using true



ON STAINLESS STEEL: Surface machined by new method is almost perfect but does have some globules suggesting remelt of the material.



HEAVY CUT: Aluminum honeycomb was machined by interrupted arcing in a series of passes $\frac{1}{2}$ in. deep, 0.650 in. wide, at a speed of 10 fpm.

electrolytic machining, since it will not cause thermal damage.

Electrolyte Problems — Another limitation of the new method concerns the use of electrolytic solutions instead of water. If ice chucks are used, the temperature of the ice must be held below the freezing level of the salt solution. However, there are new magnetic chucks which allow the use of iron shot as a holding medium.

The final limitation concerns

solid materials. On these, the interrupted-arc technique does not work as well as ordinary electrolytic machining. Removal rates are slow, and there is the likelihood of severe heat damage to the work.

The company notes, however, that the same basic Anocut equipment may be used for interrupted-arc cutting and electrolytic machining. The segmented wheel for the former and the abrasive-bearing wheel for the latter process are interchangeable.



ROLL-OVER CYCLE: Operator removes baked shell sprays pattern, and starts repeat cycle of roll-over machine.

How to Make Shell Molding Pay

Shell molding offers opportunities to simplify both casting design and processing.

More often than not these advantages outweigh the added cost of resin binder.

■ When do you use shell mold castings? The decision depends on the balance of competitive costs.

In comparison with the green sand mold, the cost of the shell mold is generally higher. The savings are most often found in subsequent processing of the casting.

To obtain accurate cost comparisons, Central Foundry Div., General Motors Corp., Saginaw, Mich., has made identical parts by both the green sand and shell molding methods. Because of advances in shell molding, C. D. Evans, product development engineer at Central Foundry, forecasts that it will soon be economical to produce most small castings by this method.

Dimensions Accurate — In the case of automotive rocker arms, for instance, mold costs increase 10.4 pct in converting to shell molding from green sand. What makes the change practical is accuracy of dimensions of the shell mold casting.

Weight is reduced 24 pct because the hole in the hub is cast through, as against a partially solid hole in the sand casting. This single item reduces shipping weights 21.5 tons a month and permits a $\frac{1}{3}$ increase in pieces drilled per hour.

The more accurate shell casting eliminates the need for machining the valve pad before finish grinding. Even though the cost of the casting increased, these advantages resulted in a saving of $\frac{1}{2}$ ¢ per piece in the finished part.

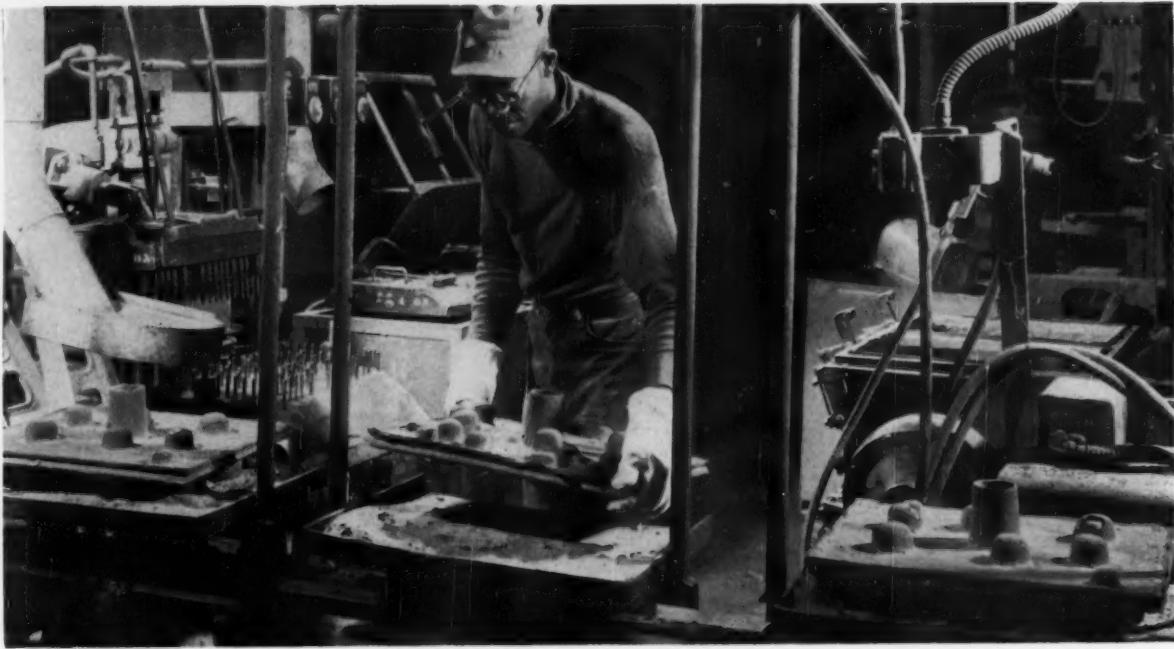
Limit on Some Parts — An automotive door hinge is an example of a part that's more costly when made by the shell molding process. The cost of casting is 40 pct more.

Since no machining can be eliminated and parts made by either method perform equally well, there can be no advantage in changing to shell molding.

For quick and simple production of complicated castings the shell process can turn out narrow accurate passages and cross sections that are practically impossible to produce in any other way without prohibitive costs. It's especially true of ferrous metals.

Eliminates Cores — The governor body and bushing for an automatic transmission were formerly made of aluminum die castings. But the steel piston rings caused excessive wear in the ring grooves. The answer to this problem was found in shell molding.

It had not been possible to cast these parts in a green sand mold because of the costly coring involved. Shell molding makes a simple job of casting.



EASY PREPARATION: After mold passes through cementing steps, conveyor carries mold to iron pouring.

On some parts where contoured areas require profile milling, shell castings have eliminated the need for this step. The trigger guard housing of an automatic rifle is an example. Only the wear and fit surfaces need be machined. Previous to use of shell method, the part was machined all over.

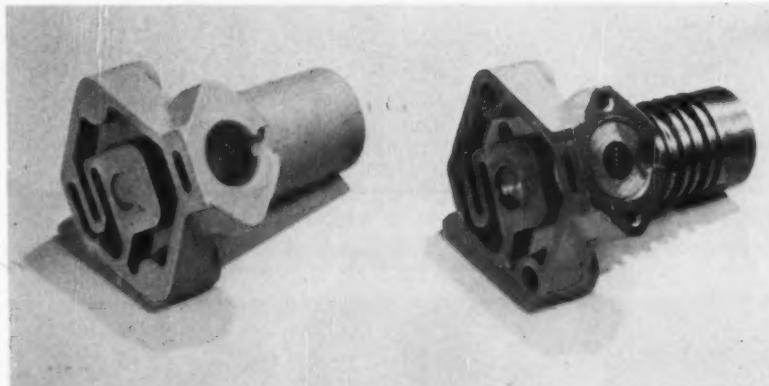
Free From Sand—A drum used in an automatic transmission takes to the shell molding method because of wider design latitude. The shell molded casting needs no machining on clearance dimensions.

Reduction in balance drilling is another advantage. Freedom from surface sand means longer tool life.

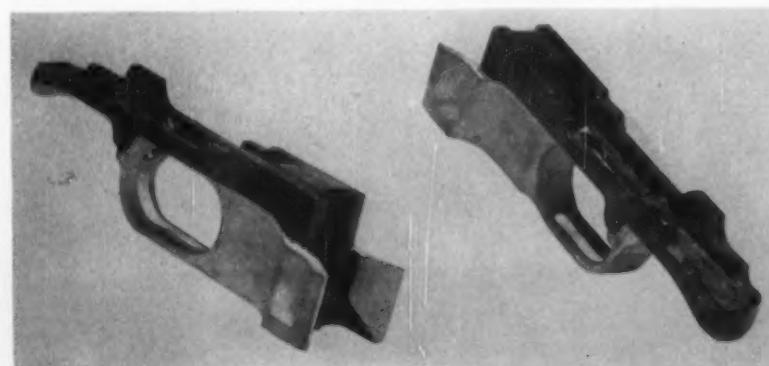
Conversion from green sand molding was justified on the basis of machine savings alone. Further, freedom from surface sand is important to a part operating in a hydraulic medium.

Permits Lighter Design — For most of the above parts, the shell mold process is practical because of savings in subsequent steps rather than in the casting itself. But some castings can actually be produced at lower cost by shell molding.

An example is the adjuster nut



PERMITS USE OF GRAY IRON: Shell molding makes a simple job of casting complex parts without use of costly coring.



LESS MACHINING: Only shaded wear and fit areas of trigger guard casting require machining. Previously the part was machined all over.

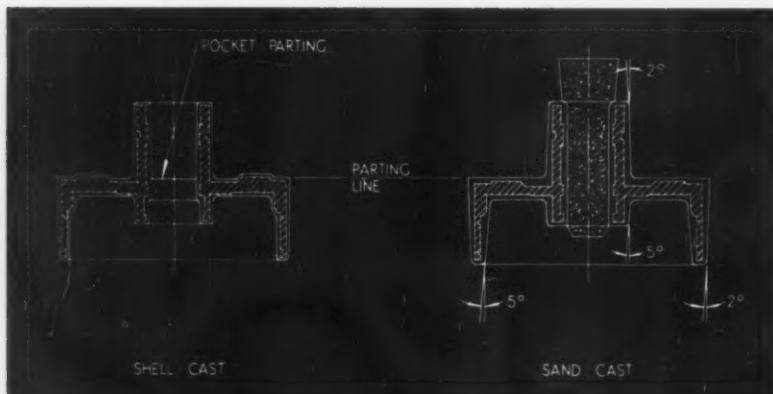


FIG. 1: Shell mold (left) requires no core for center of hub. Accuracy in shell mold permits reduction of finish stock from 0.09 to 0.06 in.

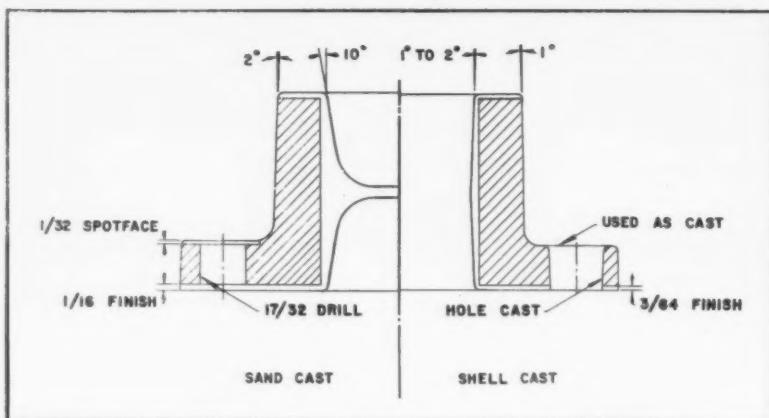


FIG. 2: Shell mold eliminates web in hub. The 17/32-in. holes are used as cast, eliminating spot-facing and drilling.



CORE SETTING: Operator inserts cores, applies glue, then places cope in position. Heat in mold speeds cementing.

for an automotive steering system. As originally designed for a sand casting, section thicknesses exceed strength requirements. Draft angles vary from 2° to as much as 10°.

Expensive coring would be the only way to get a lighter part. But going to the shell process permits draft angles of 1°. The pockets are deeper in areas where excess metal previously existed.

Aside from weight reduction, machining of stock is less and the hexagonal portion is more accurate for wrench application.

Shell Mold vs. Forging—In the case of a flange yoke used on an automotive propeller shaft, a shell molded part replaced a forging of similar design. The conversion results in a weight reduction of 8 pct and one third less machining.

The casting needs no machining on the outside and inside surfaces of the body. On the forging these surfaces require machining to provide balance and wrench clearance.

With no machining it's possible to incorporate ribs which greatly increase the fatigue life of the part. In addition, the hole through the tube can be made without a core.

Reduce Machining Stock—Fig. 1 shows a typical part where savings are possible. The sand cast design specifies a core for the center of the hub. A 5° draft angle is required to draw the sand pocket.

In addition, 0.09-in. stock is required to insure cleanup in machining. The more accurate shell mold casting permits reduction of finish stock from 0.09 to 0.06 in.

The shell method eliminates the core and draft angles are reduced to 1° on all casting surfaces. The casting's weight of 7.14 is about $\frac{3}{4}$ lb less than the green sand casting. It means a saving of several cents per casting.

Another example is the case of a hub, Fig. 2. By using a shell mold it's possible to omit the web in the hub. The 17/32-in. holes can be used as cast, eliminating a spot-face and drilling operation.



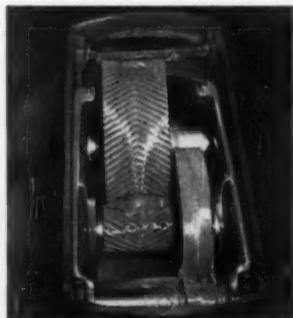
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Precious Plating

Cost of precious metal plating per unit area to specified thickness can be seen at a glance with a new chart. Simply set it to price per ounce or gram; it immediately gives you cost for gold, platinum, rhodium, silver, etc. (Sel-Rex Corp.)

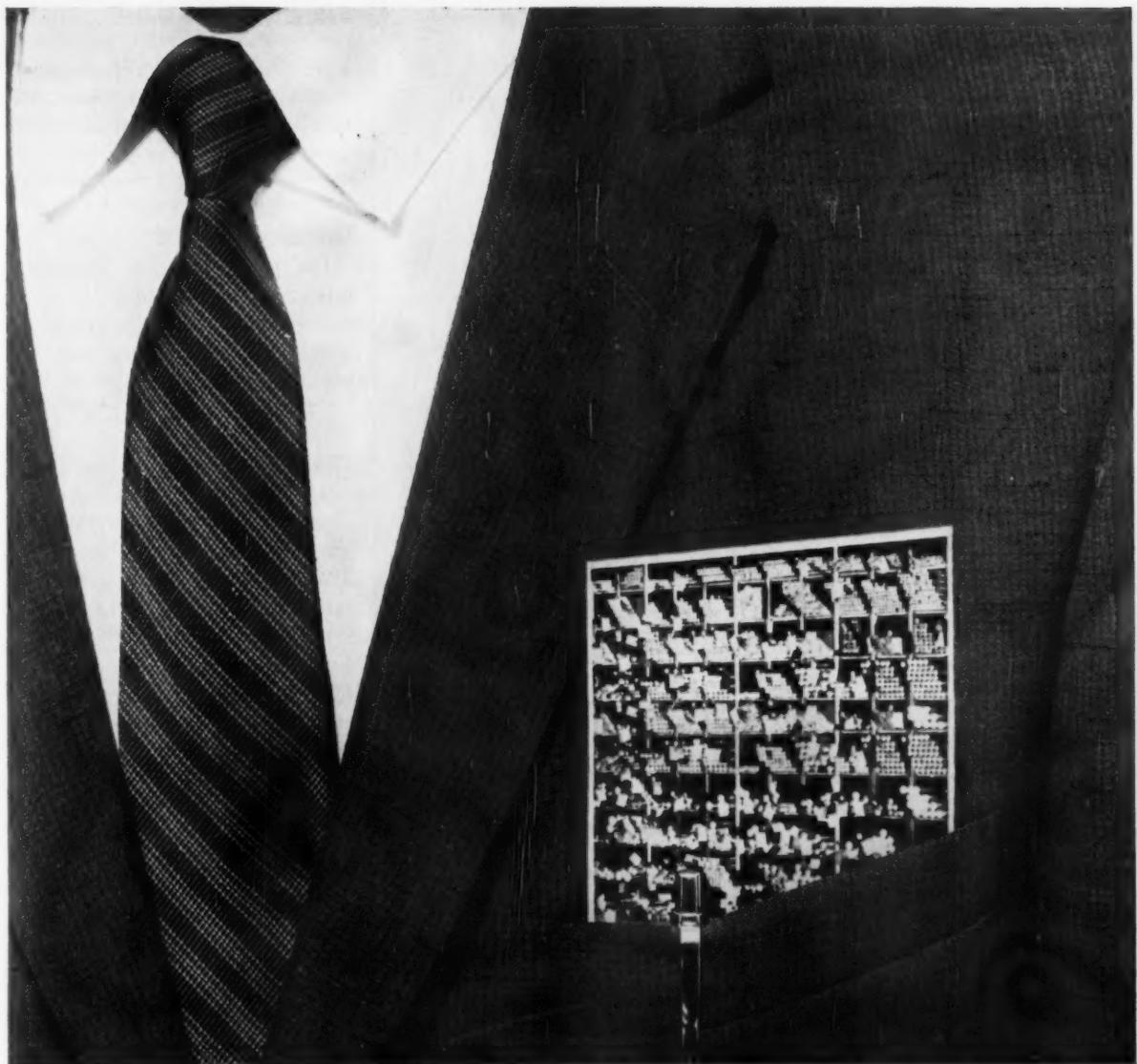
For free copy circle No. 8 on postcard, p. 105

Fasteners

If the "spec" number of a fastener is familiar but you can't quite place the face, a simple fastener-recognition bulletin may help. It works in reverse, too, when you want to tie a known configuration, say a spring pin, to its number. The bulletin puts names to shapes of

Pressure Gages

Featuring a new safety gage for severe or dangerous services, a full



it's like having a stainless steel warehouse in your pocket . . .

And it doesn't even take that much storage space. That's why so many plants are now saving money and labor by using the dependable stock racks of local Carpenter warehouses. There's a built-in bonus . . . it's Carpenter technical service, always on call with data and on-the-job help. The quality of Carpenter stainless has been speaking for itself for many years in thousands of plants. Your local Carpenter warehouse is the answer to inventory problems with stainless . . . call today. The Carpenter Steel Company, Reading, Pa.

Carpenter STEEL

Atlanta, Ga.
Baltimore, Md.
Bridgeport, Conn.
Buffalo, N. Y.
Cambridge, Mass.

Cincinnati, Ohio
Cleveland, Ohio
Dayton, Ohio
Detroit, Mich.
Hartford, Conn.

Houston, Texas
Indianapolis, Ind.
Los Angeles, Calif.
Melrose Park, Ill.
(Chicago Area)

Milwaukee, Wis.
Mountainside, N. J.
Philadelphia, Pa.
Providence, R. I.
St. Louis, Mo.

San Francisco, Calif.
Toledo, Ohio
Woodside, L. I., N. Y.
Worcester, Mass.
York, Pa.



Two A-W hydraulic cranes demonstrate materials handling abilities at Dorr-Oliver plant, Hazleton, Pa.

Twin Austin-Western 5-ton cranes speed materials handling operations

"We are well pleased with our two Austin-Western hydraulic cranes," says A. E. Oelschlager, shop superintendent of the Dorr-Oliver's Hazleton, Pa., plant. Dorr-Oliver manufactures filtration, separation and classification machinery and equipment for industrial processing.

Versatile, easy to operate

"Our first A-W crane, new in 1954, performed so well we bought a second in 1957 to meet increased production demands. They are dependable units . . . always ready to work two shifts daily if needed."

"The A-W cranes speed railroad car loading and unloading. They handle structural and bar steel, lumber and fabricated parts enroute to and from storage. With a plow attachment, they keep the plant free

of snow. Our operators like them because the hydraulic controls are simple and easy to operate. Distributor service has been excellent, and maintenance requirements have been normal."

All-wheel drive, steering

Learn of the many time and money-saving applications of this versatile materials handling crane. Its features include all-wheel steering for exceptional maneuverability; all-wheel drive for power and traction on any surface; 18-ft. telescoping boom with full circle swing; rubber mounted; self-propelled, speeds to 35 mph; choice of gas or diesel engine.

Investigate now! See your nearest Austin-Western distributor or write to us.

Austin 100th YEAR
PARTNERS IN PROGRESS **Western**
CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.
BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

FREE LITERATURE

more than 70 different fasteners with national standard (NAS, AN, MS) designations. (Standard Pressed Steel Co.)

For free copy circle No. 9 on postcard, p. 105

Burning Units

Oil, gas and oil-gas burners for firing boilers are outlined in an 8-page bulletin. In 11 sizes, they also work with other heat-exchange equipment. (Orr & Sembower, Inc.)

For free copy circle No. 10 on postcard, p. 105

Compressors

Air compressors shown in a 12-page bulletin range from $\frac{1}{2}$ to 15 hp. Available pressures are 80 to 250 psi. (Le Roi Div., Westinghouse Air Brake Co.)

For free copy circle No. 11 on postcard, p. 105

Cryogenics

Engineering papers include one titled "Low Temperature Production and Control in Environmental Testing and Application Facilities." The other is "Applications and Economics of the Norelco Gas Liquefier for Recovery of Flash Gases." (Philips Electronics, Inc.)

For free copy circle No. 12 on postcard, p. 105

Fuel Burners

A bulletin covers vortex type burners. Output range is up to 50,000,000 Btu/hr. (Thermal Research & Engineering Corp.)

For free copy circle No. 13 on postcard, p. 105

Contract Shop

Facilities for service to the Armed Forces and their prime contractors are presented in a booklet. Its 28-pages show capabilities in military goods from concept to hardware. (Military Products Div., Singer Mfg. Co.)

For free copy circle No. 14 on postcard, p. 105

Ferroalloys

Ferroalloys listed in a new publication include additions of: chromium, silicon, manganese, van-

dium, columbiun, boron, titanium and other metals. Other products listed: special foundry alloys, vanadium metal, silicon metal, aluminum alloys, and a variety of exothermic alloys. (Vanadium Corp. of America).

For free copy circle No. 15 on postcard, p. 105

Crucible Tongs

New lifting tongs and shank detailed in a bulletin eliminate dangerous spills from broken crucibles and prolong crucible life. The tongs grasp around the base, preventing bottom failure if a crack occurs. They also permit use of crucibles after they wear thin. (Inductootherm Corp.)

For free copy circle No. 16 on postcard, p. 105

Adhesives, Coatings

Design concepts, applications and characteristics of adhesives, coatings and sealers are outlined in a 12-page catalog. (Adhesives, Coatings & Sealers Div., Minnesota Mining & Mfg. Co.)

For free copy circle No. 17 on postcard, p. 105

Epoxy Curing

Long pot life and low volatility are advantages of three new hardeners for epoxy resins. The anhydrides have uses in laminating compositions, potting, encapsulating and impregnating. They are also curing agents for preparation of tools and dies and baked coatings. (National Aniline Div., Allied Chemical Corp.)

For free copy circle No. 18 on postcard, p. 105

Table Conveyors

Uses of table conveyors are discussed in a booklet. It gives lengths, widths, and working heights available. (Rapids-Standard Co., Inc.)

For free copy circle No. 19 on postcard, p. 105

Thermometers

Indicating dial thermometers offered in a 12-page catalog measure in the -40° to $+1000^{\circ}\text{F}$ range. (U. S. Gauge Div., American Machine & Metals, Inc.)

For free copy circle No. 20 on postcard, p. 105

*... of Duraloy HH Alloy, one of the
most widely used high chrome,
medium nickel alloys.*

Two items concerning these furnace rolls may be of particular interest:

a—the size: 20 feet long—14" OD, $\frac{3}{4}$ " wall thickness
b—welding operations by which reducing cones and shafts (both statically cast of the same alloy) were welded to the centrifugally cast rolls

These two items will serve to emphasize two phases of our service: (1) the large size centrifugally cast tubes we are able to produce and (2) our machining and finishing facilities, including welding.

Our new 16-page general Bulletin — 3354-G — gives complete details. Would you like a copy? When writing or calling would you mind telling us the general nature of your high alloy casting requirements? Better yet, if you have specific requirements on which we could help, let us have the details.



URALOY COMPANY

OFFICE AND PLANT: Scranton, Pa.
EASTERN OFFICE: 12 East 41st Street, New York 17, N. Y.
ATLANTA OFFICE: 76—8th Street, N. W.
CHICAGO OFFICE: 232 South Michigan Avenue
DETROIT OFFICE: 23904 Woodward Avenue, Pleasant Ridge, Mich.

DURASPUN

20-FOOT FURNACE ROLLS
Centrifugally Cast

LABOR and PARTS SAVINGS

TURN PROBLEMS INTO

PROFIT\$

with the

Saginaw Screw

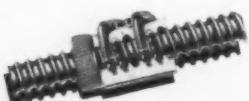
"WE USE ONE COMPACT SAGINAW SCREW IN PLACE OF THREE COMPLEX AND COSTLY PARTS NEEDED BEFORE on our printing plate PlateShaver. The Saginaw Ball Bearing Screw has cut our manufacturing time and material costs considerably. And our product has more Sales Appeal because our PlateShaver now has considerably less mechanical parts and thus less potential mechanical trouble and maintenance," says Mr. Lee Hammond, President of Hammond Machinery Builders, Kalamazoo, Michigan.

You can turn *your* product problems into profits, too, when you switch from inefficient actuation methods to the virtually frictionless Saginaw b/b Screw for greater Sales Appeal!

The Saginaw Screw converts *rotary* motion into *linear* motion with over 90% efficiency. No wonder progressive manufacturers are saving so much time, power, weight, space and cost by simply switching from inefficient acme screws or costly chain drives and hydraulics to these versatile Saginaw Screws.

They have been produced from 1½ inches long for delicate electronic controls to 39½ feet long for huge machinery.

Perhaps the Saginaw Screw can give *your* products that vital new Sales Appeal you're looking for right now. To discover how, simply write or telephone Saginaw Steering Gear Division, General Motors Corporation, Saginaw, Michigan—*world's largest producers of b/b screws and splines*.



*Give your products
NEW SALES APPEAL...
switch to the*

Saginaw
Ball / **Bearing** **Screw**

WORLD'S MOST EFFICIENT ACTUATION DEVICE

The Hammond PlateShaver uses one Saginaw Screw to eliminate a gear speed reducer, automatic safety clutch, and chain drive mechanism. Results: lower manufacturing cost and sales price and more trouble-free operation.

FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Brazing Cement

Applying brazing alloys for high-temperature service with a new cement is described in a data sheet. Included is a chart showing approximate Zahn viscosity numbers for six different thicknesses of the cement. (Wall Colmonoy Corp.)

For free copy circle No. 21 on postcard

Tumbling Barrel

Auxiliary tumbling barrels for wet blast equipment are covered in a bulletin. Deburring and precision cleaning of small parts are done rapidly in wet blast equipment using the barrel. (Wheelabrator Corp.)

For free copy circle No. 22 on postcard

Rough, Finish Boring

Rough and finish boring and reaming tools are presented in an 18-page booklet. It explains the "floating cutter" action of a finish reaming tool. And it shows the single-screw adjustment and interchangeability which permits changing of cutters without removing a bar from the machine. (Muskegon Tool Industries, Inc.)

For free copy circle No. 23 on postcard

Box Printing

Printing on corrugated boxes is discussed in a booklet. (Hinde & Dauch).

For free copy circle No. 24 on postcard

Aircraft Overhaul

Overhaul and repair of jet engines and airframes is examined in a report. Its 32 pages emphasize

basic maintenance and repair by resistance welding. Particular attention is directed to the free use of ingenuity in applying spot, seam and flash-butt resistance welding. (Sciaky Brothers, Inc.)

For free copy circle No. 25 on postcard

Welded Pipe

Continuous weld pipe is the subject of an 8-page booklet. Color photographs portray work at two new mills. (Jones & Laughlin Steel Corp.)

For free copy circle No. 26 on postcard

Press Die Sets

Systematic die set maintenance whenever a die is removed from a press for sharpening is discussed in a company publication. (Producto Machine Co.)

For free copy circle No. 27 on postcard

Power Packages

Power packages (400-cycle) are detailed in a 6-page bulletin. Units incorporate a unit-mounted motor, inductor-alternator and controls. (Safety Industries, Inc.)

For free copy circle No. 28 on postcard

Vacuum Dryers

Major design features of rotary vacuum dryers are described in a 4-page catalog. (F. J. Stokes Corp.)

For free copy circle No. 29 on postcard

Welding Positioners

Explaining importance of ground current conduction for welding positioners is a 13-page booklet. (Aronson Machine Co.)

For free copy circle No. 30 on postcard

Steel Casting

A 36-page booklet analyzes the role of molybdenum in heat treated low alloy steel castings. (Climax Molybdenum Co.)

For free copy circle No. 31 on postcard

Air Filters

Three high-efficiency mechanical air filters are introduced in a bulletin. One filter has closely

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted.

2/5/59

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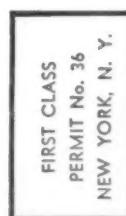
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FREE LITERATURE

spaced pleats of filter media; corrugated separators lay between folds. Another is a dry-type filter for higher than normal cleaning efficiencies. The third is a pocket type, handling dry filter media of more than usual thickness, giving air cleanliness in the range of electronic precipitators. (American Air Filter Co.)

For free copy circle No. 32 on postcard

which insulation and either aluminum or steel skin are impaled. These apply directly to the tanks. (Nelson Stud Welding Div., Gregory Industries, Inc.)

For free copy circle No. 37 on postcard

Thermostat Metal

Helping save time in picking correct thermostat-metal element size and properties for a particular application is a 4-page bulletin. It lists 40 different metals. (Metals & Controls Corp.)

For free copy circle No. 38 on postcard

Copper Tubing

Skills and techniques necessary to making quality seamless copper and copper alloy tubing are discussed in a brochure. (Wolverine Tube Div., Calumet & Hecla, Inc.)

For free copy circle No. 33 on postcard

Force Measure

Semi-technical, a booklet compares techniques for measuring force, weight, pressure, etc. (Electronics & Instrumentation Div., Baldwin-Lima-Hamilton Corp.)

For free copy circle No. 39 on postcard

Part Storage

For all types of parts that roll, a new high-capacity, demand-type storage unit uses a parts elevator and zig-zag retaining tracks. It stores and/or feeds up to 3000 parts. A data sheet describes the equipment. (Michigan Tool Co.)

For free copy circle No. 34 on postcard

Drainage Systems

Wrought iron for building drainage systems is discussed in a 64-page booklet. (A. M. Byers Co.)

For free copy circle No. 40 on postcard

Temperature Controls

Pneumatic temperature controls are described in a 4-page folder. The instruments fit many heating appliances. Range is -30 to 1100°F. They use no electricity (Partlow Corp.)

For free copy circle No. 41 on postcard

Overhead Conveyors

Low-cost overhead conveyor systems are covered in a 12-page catalog. It contains typical installations and layouts together with engineering specifications. (Chainveyor Corp.)

For free copy circle No. 42 on postcard

Hole Gage

Information on a hole gage and its setting fixture is contained in a bulletin. It shows how the fixture sets the gage to dimensions of $\frac{1}{2}$ tenths (0.000050-in.) without need of masters, rings or setting blocks. (Sennen Service Corp.)

For free copy circle No. 43 on postcard

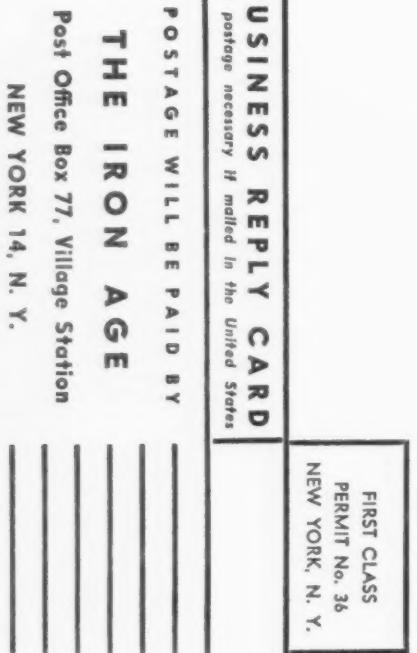
Stainless Steel

What's new in stainless steel? A new publication gives the answers. It describes new grades, finishes, facilities, services, and shapes. (Armco Steel Corp.)

For free copy circle No. 36 on postcard

Tank Insulation

Installing insulation on large storage tanks for hot materials is discussed in a 4-page bulletin. It reports savings to 30 pct or more. Shown are end-welded studs on



Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **2/5/59**

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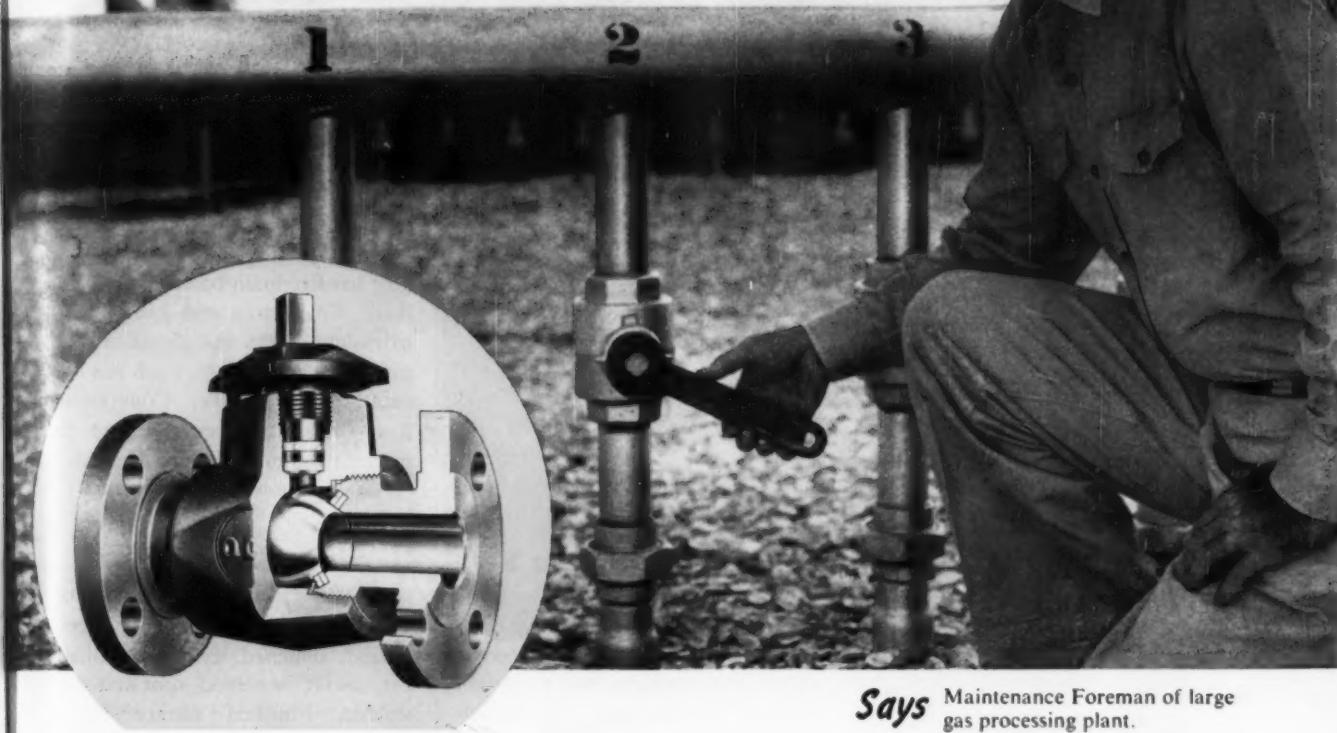
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"There are no bugs in this new product"



Says Maintenance Foreman of large gas processing plant.

W-K-M's new QCF non-lubricated BALL VALVE

This new product of
W-K-M's Creative Engineering
has been service-proved
with these ladings.

Acetate • Crude ammonia liquor • Aviation fuel and Stoddard solvent • Propane • Toluol • Methylethylketone (MEK) • Alkaline slurry • Jet engine fuel (test cells) • Naphtha and coal tar solvents • Paint cleaner and thinner • Liquid soaps, DDT and chlordane • Vinyl chloride • Butadiene liquid • Copper ammonium acetate • Carbon bisulphide • Cleaning naphtha • Lime and soda ash slurry • Riboflavin media • Gasoline (tank truck) • Helium gas • Coke oven by-product gas • Gasoline (tank car) • Chlorinated solvents.

For 3½ years, users tested this new valve in the hardest services that could be found.

Now, W-K-M offers it to you as a **service-proved** new product, a new product with no bugs, a typical example of W-K-M's leadership in design, production and service.

This valve will deliver promised performance; you can specify it with complete confidence in its efficiency, economy, ease of operation and maintenance.

You should know more about it.

Write for Catalog 1000 for complete information.

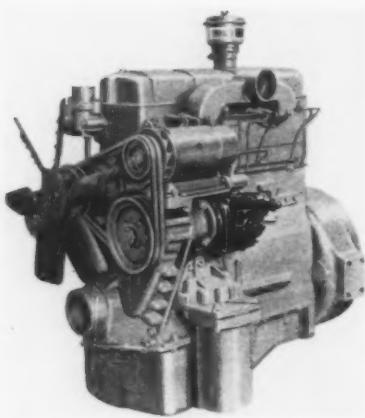
AVAILABLE in carbon steel (ASA 150 lb., 300 lb.), and semi-steel (200 lb. WOG, 400 lb. WOG); sizes range from ½" through 6". Also ASA 600 lb., sizes ½, ¾ and 1".

W-K-M

DIVISION OF QCF INDUSTRIES
INCORPORATED

P. O. BOX 2117, HOUSTON, TEXAS

New Materials and Components

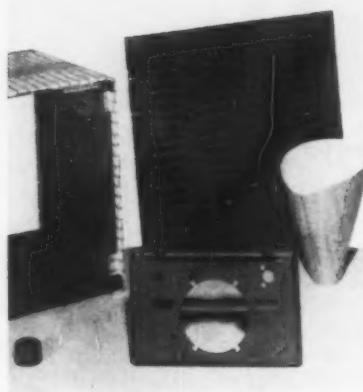


Diesel Engines Deliver 70 and 80 Horsepower

Two new diesel engines provide 70 and 80 hp respectively. They're designed to bring benefits of diesel engine economy to equipment previously powered almost exclusively by gasoline engines. Such equipment includes: generator sets, air compressors, tractors, light trucks and buses, pumping systems and some construction equipment. Key advantages are reduced fuel and maintenance costs, and long engine life. Engines are 4-cycle, nat-

urally aspirated models of $4\frac{1}{8}$ x 5 in. bore and stroke with 267-cu in. displacement. One model develops 2500-rpm rated hp; the other rates at 2000-rpm. Each engine has five main bearings of $\frac{3}{8}$ -in. diam. Connecting rod journals are extra-large ($2\frac{1}{8}$ -in. diam). Piston pins are $1\frac{1}{2}$ in. diam. Each has five camshaft bearings. Conversions from other type engines can be made. (Cummins Engine Co. Inc.)

For more data circle No. 55 on postcard, p. 105

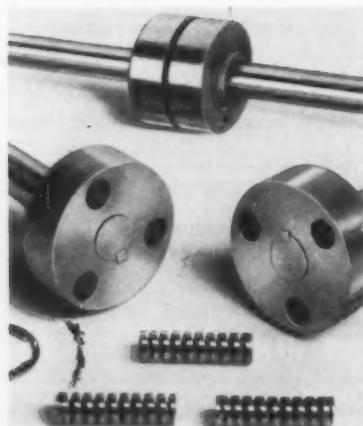


Vinyl Laminates to Steel, Aluminum, Magnesium

Pre-laminated materials now are available in a variety of vinyl laminates and base metals. They come in cut-to-size sheets, ready for fabrication; or laminates can be applied to your own materials. There's a wide latitude in specifications; you can specify almost any base material, texture and design, and any color or multi-color combination. Vinyl laminates are finished in leather, woodgrain, woven, linen and other textures. Finished lami-

nates are ready for fabrication. They can be bent, drawn, spun, embossed, punched, crimped, drilled, cut, sawed, cemented, spot and stud welded. Finished surface resists abrasion, corrosion, heat, humidity, alcohol, petroleum products, some acids and chemicals, salt water and detergents. Surface will not chip, mar or scratch because of a clear, protective 2-mil coating. (North-East Laminates, Inc.)

For more data circle No. 56 on postcard, p. 105



Free-aligning Coupling Uses No Nuts or Bolts

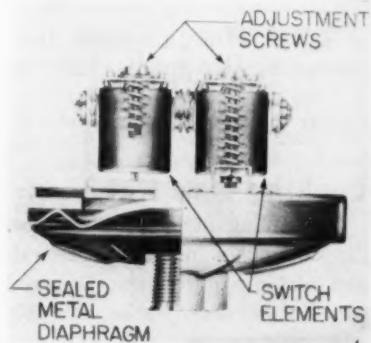
So simple is a new coupling's design that machinery can be connected or disconnected with a screwdriver. The free-aligning coupling uses no nuts or bolts. Halves of the coupling are joined and transmit thrust through helical wire springs. Springs hold in place via snap or split rings. The coupling operates in either direction of rotation and can be installed vertically without any parts change. Shock absorbing, the coupling permits

maximum misalignment because it transmits torque without end thrust, even under load. Couplings have a 7 to 1 load factor. Standard sizes are: light duty (to 2-in. diam shaft size); medium (2 to 5-in. shaft diam); heavy (5 to 12-in. shaft diam). Larger ones come as special models. Coupling is usually all-steel; other materials can be specified, though. (Automatic Mfg. Co.)

For more data circle No. 57 on postcard, p. 105

Pressure Switches

Especially built for manufacturers of moving or vibrating equipment are new pressure and vacuum switches. Stripped versions of widely-used housed diaphragm switch models, they operate in any position, making unnecessary any balancing or leveling. Since they're not vibration sensitive, they can be mounted directly on vibrating or moving equipment. Recommended



for liquid, gas or water systems, the switches come in proof pressures of 30-in. mercury vacuum to 150-psi pressure. Each switch accurately senses any two pressures in the same system over an adjustable range of 30-in. mercury vacuum to 100-psi pressure, and actuates two independent electric circuits at predetermined pressures. (Barksdale Valves).

For more data circle No. 58 on postcard, p. 105

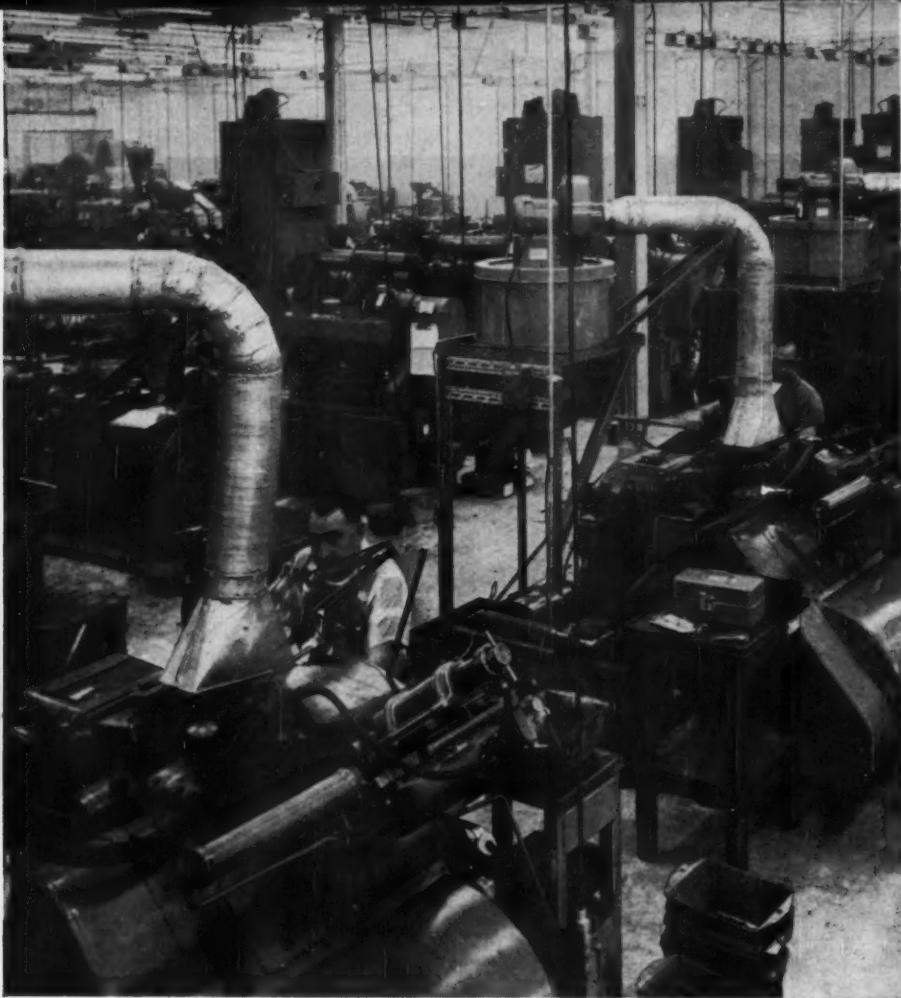
Band Saw Wheels

Special reinforced wheels have uses on band saws, band resaws and other extremely heavy-duty equipment. Rims have a double thickness of quality steel, making them five times stronger than normal, according to their producer. The wheels offer new dynamic balancing for absolute vibrationless operation, at any high speeds. (Carter Products Co.)

For more data circle No. 59 on postcard, p. 105

Pin-cage Clutch

For rugged duty, a pin-cage centrifugal clutch is said to register substantial savings when applied to electric motors and gasoline en-



NEW This is the old grind at ALEN

A quarter of a million square feet of space in the great new Allen plant is devoted to precision fasteners — and much of it houses batteries of the latest, high-speed-automatic centerless grinding equipment. Here you see a close-up of the grinding section set up to produce dowel pins at the rate of one a second per machine.

Allen's vast new facilities assure constant standards of uniformity, accuracy, strength and fit, many of which are duplicated nowhere else. Now there's more reason than ever to make Allen your Buy-Word for socket screws, keys, pipe plugs and dowel pins.

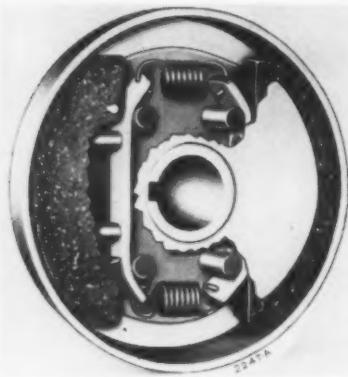
Speaking of dowel pins — specify Allen for great strength where you need it most. Made of Allenoy steel, they're surface hardened to 62-64 Rockwell C. Core hardness 47-53. Case depth .010" to .020". Shear strength from 160,000 to 180,000 psi. Precision-ground to $\pm .0001"$, with a mirror finish of 6 RMS max.

In stock at your Allen Distributor . . . in diams. from $\frac{3}{16}"$ thru 1" . . . lengths from $\frac{3}{16}"$ thru 6". Also in two standard oversizes — .0002" for press fit, .001" for repairs. For more details, ask your local Distributor, or write directly to the Allen Manufacturing Company, Hartford 1, Conn.



DESIGN DIGEST

gines. Speed of the prime mover and centrifugal force govern the clutch's operation. Advantages in accelerating high inertia loads include: (1) the engine or motor can run at efficient speed while the

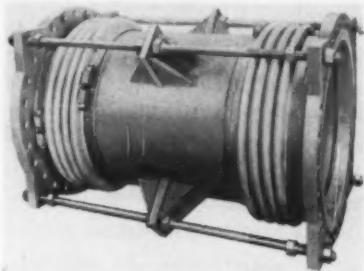


load accelerates; (2) free-wheeling in either direction is available when the prime mover stops. The clutch is recommended for stand-by power and provides dual drive when ap-

plied to a motor or engine. It's good, too, where high efficiency low-slip ratio is necessary with a high load factor. In addition, it gives heavy, rugged service. Because of positive camming action between shoes and drive pins, the load "locks in" almost immediately, resulting in rapid engagement. (Fairbanks, Morse & Co.)

For more data circle No. 60 on postcard, p. 105

72-in. diam. Joints handle medium pressures at high temperatures (1600°F) or medium temperatures



at high (2500 psi) pressures. Temperature range is from -320°F to $+1600^{\circ}\text{F}$. (Zallea Brothers)

For more data circle No. 61 on postcard, p. 105

Expansion Joints

New bellows-type expansion joints accommodate pipe movement in any direction. The packless, corrugated-bellows units protect power and process piping systems. They absorb displacement by axial movement, lateral deflection and angular rotation, either singly, or in any combination. Joints absorb unlimited amounts of lateral deflection without imposing any pressure thrust on piping or equipment. They eliminate need for heavy structural anchors. Standard sizes run 3- to

Locking Cap Nuts

Self-sealing and self-locking, new capped anchor nuts meet aircraft and missile requirements. Designed to withstand abuse during assembly and maintenance work, the nuts consist of a heat-treated drawn steel shell. A rubber sealing ring is molded to its aluminum base ring.

that "NEEDED LIFT" can come from

You name the job or jobs to be done! We'll supply a crane or cranes that will do it. Standard Models in a wide range of styles, sizes and capacities will generally meet your requirements. If not, we'll engineer and build what you need. We've been doing it for more than 40 years.

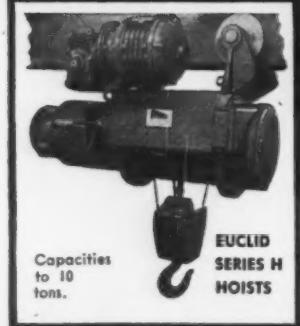


CRANES & HOISTS

TO

"RAISE PROFITS"

GET A EUCLID PROPOSAL



Capacities
to 10
tons.

EUCLID
SERIES H
HOISTS

EUCLID HOISTS are highly efficient and strictly modern in every detail with oversize anti-friction bearings and heat treated steel parts in combination with a welded frame.

The planetary gearing and mechanical load

for Details & Catalog, write

brake are mounted in oil tight housings. The hoist gearing is assembled in the hoist drum.

This design produces an unusual compact, rugged and accessible hoist readily adapted to various installations and types of control.

THE EUCLID CRANE & HOIST COMPANY

1361 CHARDON ROAD • CLEVELAND 17, OHIO

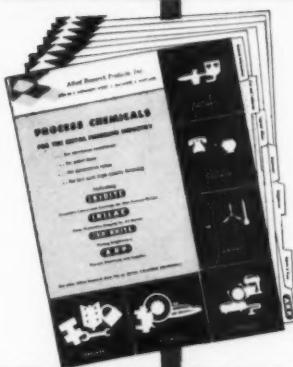
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DIAMONDS—SIGN
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METAL FINISHING PROCESSES

A complete line of quality products and processes developed primarily as a result of helping manufacturers like yourself solve their metal finishing problems. If one of our present products does not meet your needs, we'll be glad to work with you to find an answer to your problem.



IRIDITE® Chromate Conversion Coatings for Non-Ferrous Metals.

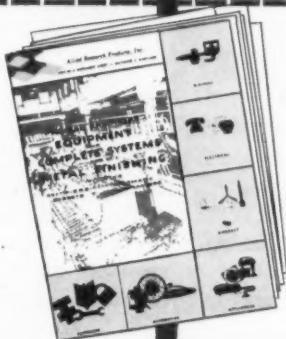
IRILAC™ Clear Protective Coatings for All Metals.

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EQUIPMENT AND COMPLETE SYSTEMS for Metal Finishing

Process Engineered—Single pieces of equipment or all equipment necessary for a finishing operation—evaluated, designed, fabricated, installed and tested to match exactly your particular process. Ask about our *Process Engineering Service*.



WAGNER RECTIFIERS

Silicon and Selenium, built to exacting specifications for long life, trouble-free service.

WAGNER AUTO-LOADERS

for fast, economical transfer of racks and parts, conveyors to plating machines, between conveyors.

AUTOMATIC AND SEMI-AUTOMATIC PLATING MACHINES

BARRELS, TANKS and other equipment.



FLAT-TOP® ANODES

in copper and zinc.

LECTROCOP® FLAT COPPER ANODES

CADMUM, WHITE BRASS AND TIN ANODES in most efficient shapes. Acid Replacements, Buffs, Chemicals, Cleaners, Maintenance Materials.

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Prompt service on a wide variety of daily-use necessities for the plating room, delivered from warehouse stocks strategically located in cities in metalworking areas.

Ask your Allied Field Engineer about our Subscription Plan which combines your new nickel purchases with a service to recast your butts and spears, resulting in substantial savings.

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Chemical and Electrochemical Processes, Anodes,
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WRITE TODAY FOR COPIES of these useful files describing technical details of our complete line, OR, phone your Allied Field Engineer. He's listed under "Plating Supplies" in your 'phone book.'

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*Don't get caught
in an Inventory Squeeze!*

Too much inventory can really jam you up, in more ways than one. You not only incur substantial initial costs that tie up your capital, but also find that the costs piled up by scrap, wastage, obsolescence, maintenance, handling and cutting equipment, taxes and insurance are prohibitive. In addition, valuable floor space is unavailable for other uses, such as heat-treating or machining operations.

Turn all this around, and you see the many positive benefits made available to you by your local Wheelock-Lovejoy Steel Service Center. W-L Warehouse Service offers complete facilities, service and stocks... complete handling and cutting facilities... fast delivery... personal service by expert W-L metallurgists who'll give you technical information on grades, applications, physical properties, tests, heat treating, etc.

Add up all the advantages, and you'll agree that it makes good sense to deal with W-L. Write today for Wheelock-Lovejoy Data Sheets.

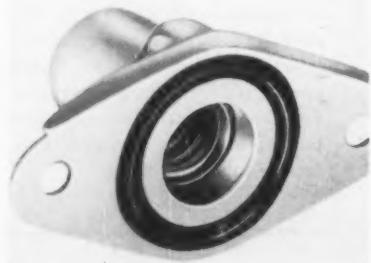
**WHEELOCK,
LOVEJOY
& COMPANY, INC.**
126 Sidney St., Cambridge 39, Mass.

WAREHOUSE SERVICE—Cambridge • Cleveland • Chicago • Hillside, N. J. • Detroit • Buffalo • Cincinnati
• AGENTS—Southern Engineering Company, Charlotte, N. C. • Sanderson-Newbold, Ltd., Montreal & Toronto.



DESIGN DIGEST

A self-locking nut, free to float 0.020-in. laterally from centered position inside the cap, compensates for possible bolt misalignment during assembly. Sealing rings handle aircraft fuels per specification MIL-R-6855. Seals also are available for higher temperatures and/or other liquids. "Push-out" exceeds specifications by 300 pct and assures positive sealing regardless of adverse assembly or bolt misalignment. In sizes $\frac{1}{4}$ -in.-28 and up,

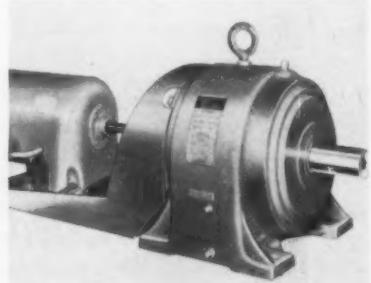


reinforcing lugs insure maximum push-out strength and sealing. Nut thread height adapts to shear thread length bolts at rated tensile loads of 125,000 to 140,000 psi. Thread sizes 10-32 and $\frac{1}{4}$ -in.-28 are now in production; $\frac{5}{16}$ -in.-24 soon will be. (Elastic Stop Nut Corp. of America).

For more data circle No. 62 on postcard, p. 105

Gear Reducer

Combined gear reducer and gearshift drive units give 4 to 8 speeds on the reducer output shaft. In double and triple gear reduction setups, they have motor capacities



from 1 to 10 hp. The reducer combination unit is for applications where more than one speed on the

output shaft of the gear reducer is desirable. By moving the shift lever on the gearshift drive into one of four positions, four different output shaft rpm's are obtainable on the gear reducer. Standard electrical characteristics of the new gear reducer combination are: constant-torque, 3 to 2 phase, 60 cycle, 208, 220/440 or 550 v. (Lima Electric Motor Co., Inc.)

For more data circle No. 63 on postcard, p. 105

Positioning Switch

Fast, reliable, remote control of air-run industrial processes is possible with this positioning switch. It eliminates lags between the switch and actuator mechanism. Some 20 pct smaller than earlier models, it allows compact flush or surface mounting on panel boards. Uses, primarily, are remote control of pneumatic valves, damper motors, etc. Turning the switch knob gradually increases or decreases compressed air flow to such



devices, opening or closing them to any desired position. There's no lag between switch position change and corresponding air pressure change. (Powers Regulator Co.)

For more data circle No. 64 on postcard, p. 105

Molding Compound

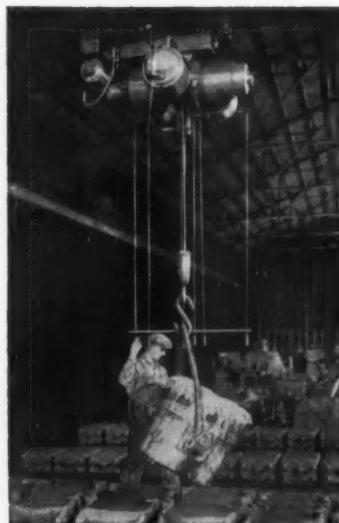
Molding compounds in a new line boast high strength, high temperature resistance and ease of molding, either by compression or by transfer system. The compounds have a high glass content, up to 70-pct of either standard "E" glass or high silica content glass. Some

SHEPARD NILES

HOISTS

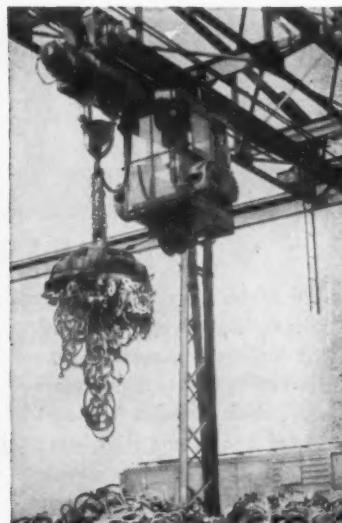
CUT HANDLING COSTS

in YOUR plant with the right hoist



FLOOR-OPERATED HOIST

Operator primarily occupied with other duties, uses hoist for fast, efficient short hauls.

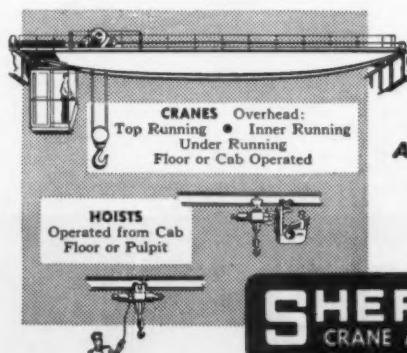


CAB-OPERATED HOIST

Cab operator moves loads at high speeds, can quickly spot material for handling.

WHICH Shepard Niles hoist fits your plant's needs . . . a floor-operated hoist where the operator is freed for other duties or a cab-operated hoist where the operator is engaged full time moving loads through the air? Shepard Niles manufactures both types in capacities from 1 to 20 tons.

Send for the descriptive bulletins on both Cab and Floor Operated Hoists . . . or ask that a Shepard Niles representative call — there's NO OBLIGATION.



Building

**America's Most Complete Line
of Cranes and Hoists
Since 1903**

SHEPARD NILES
CRANE AND HOIST CORPORATION

1495 Schuyler Ave., Montour Falls, N. Y.

DESIGN DIGEST

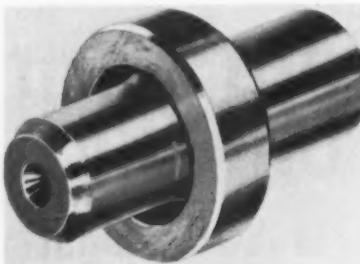
of them resist 20,000°F for a short duration. (Coast Mfg. & Supply Co.)

For more data circle No. 65 on postcard, p. 105

Locating Pins

Locating pins, in two styles, now are available from a manufacturer in 368 different sizes. Made in diamond and round styles for locat-

ing, they're designed with a resting shoulder to act as rest pads. The 368 sizes range from $\frac{1}{8}$ to $1\frac{1}{2}$ -in. head diameters. They are used in

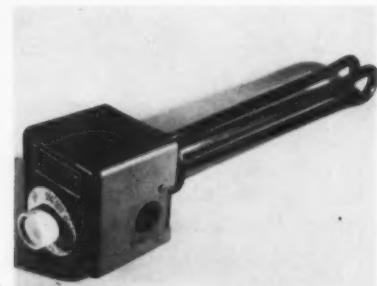


bushing applications; also press fitted with lock screw holder. Concentricity is held within ± 0.0002 throughout. Both styles are carburized, hardened to Rc 60-62 for tough wearing surface with core left mild. (Jergens Tool Specialty Co.)

For more data circle No. 66 on postcard, p. 105

Immersion Heaters

For heating water and oil solutions, new immersion heaters fit humidifiers, quench tanks, fuel oil pre-heaters and other setups. Water heaters have a copper sheathed heating element brazed into a brass plug. Their built-in thermostat serves an 80 to 220°F temperature



WEBB PLATE FABRICATING MACHINERY

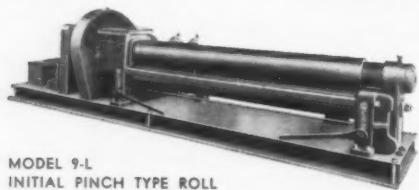
PLATE BENDING ROLLS

The Webb Corporation offers a complete line of Plate Bending Rolls for the rolling of the thinnest plate up to plate $2\frac{1}{2}$ " thick. Offered in a variety of lengths and thicknesses. Constructed for the modern fabricating shop.



MODEL PBR-500
PYRAMID TYPE ROLL

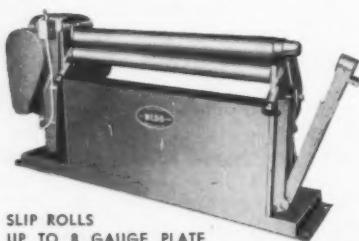
Two types available: the Initial Pinch Type and Pyramid Type machines. All latest advantages of today's modern machine tools are incorporated, utilizing anti-friction bearings, totally enclosed gear drives. Special forming rolls for culvert pipe, stock tanks and other special shapes available.



MODEL 9-L
INITIAL PINCH TYPE ROLL

SLIP ROLLS

A complete line of small Sheet Metal Forming Rolls are also available. All power-driven with shaft sizes 3" to 5" for the handling of the thinnest gauge material, up to 8 gauge material. Special rolls for the forming of polished sheets, aluminum and stainless steels can be furnished. Complete catalogues on any size machine furnished upon request; write Dept. E.



SLIP ROLLS
UP TO 8 GAUGE PLATE

Let Speed PAY-The WEBB Way!



Since 1881

THE WEBB CORP.

WEBB CITY, MO., U.S.A.

range. Oil heaters have a steel sheathed heating element brazed into a steel plug. Its thermostat range is 150 to 550°F. Watts density for water heaters is 55-w per sq in. of sheath surface. Density for oil heaters is 20-w per sq in. Heating units' over-all lengths range from $15\frac{1}{4}$ to $45\frac{3}{4}$ in. (General Electric Co.)

For more data circle No. 67 on postcard, p. 105

Machine Bolts

Hex-head machine bolts and carriage bolts in more than 500 different sizes make up a new fastener line. The full body hex-head machine bolts come with or without finished hexagon nuts. They have a minimum tensile strength of 55,000 psi. Diameters run from $\frac{1}{4}$ to $1\frac{1}{4}$ in.; lengths, $1\frac{1}{2}$ to 24 in. Carriage bolts come in sizes from No. 10 to $\frac{3}{4}$ -in. diam; lengths, $\frac{1}{2}$ to 18-in. With full size bodies, they're supplied with or without regular square nuts. (Standard Screw Co.)

For more data circle No. 68 on postcard, p. 105

Why it makes sense to upgrade your metal-cutting band saws now!

This is the best time to replace your old sawing machines because:

1. Faster Cutting Rates

Fifteen years of progress in the last five—that's what DoALL band machining now offers you! For example, DoALL's Demon® HSS Blades on new DoALL machines cut 10 times faster—and last 30 times longer than any carbon blade.

The reason: DoALL's new Contour-matics® are built far more rugged to attain greater accuracy than ever before. They employ coolant and hydraulic work feed.

The result: enormous savings in production time and labor in your shop—an entirely new concept in metalworking undreamed of with the early Model ML, which uses only carbon blades.

2. Old Machines Now Worth More

There's more value in your old DoALL now than there ever will be. In numerous cases the current market price of the obsolete Model ML equals or exceeds its original cost. Rather than give up the "old faithful," many users have found other uses for it in their own plants—for the scope and application of band saw machining has expanded greatly every year.

3. Easier Terms

Long-term purchase contracts are available for all DoALL machine tools.

A lease program, originated by DoALL, is available for those who want to take advantage of cost-saving DoALL equipment without capital expenditure.

4. Lower Costs

"Tooling for competition" requires a frank appraisal of your sawing costs. Let us demonstrate the new performance of DoALL band machining.

PRODUCTIVE MAINTENANCE

Productive Maintenance is your assurance of continuous profitable performance on all DoALL machines. It is an included service to DoALL users. Ask your local DoALL representative about "Package Service."

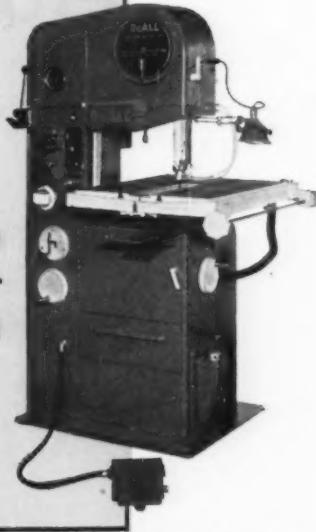
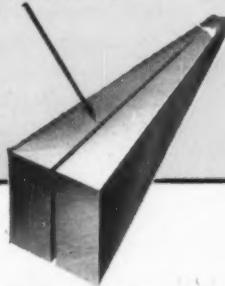
B-54

COMPARE...

1958 MODEL 16-3

GIVES YOU . . .

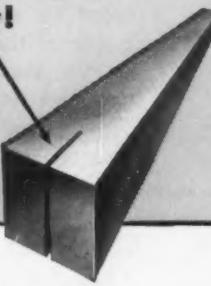
592% faster sawing
on 1015 mild steel—
10.1 sq. in. per min.!



Heavy-duty Model 16-3 with coolant and hydraulic work feed, designed for Demon HSS Blade.

OBSOLETE MODEL ML GIVES YOU . . .

a cutting rate of only
1.7 sq. in. per min.
—terrific in its day
but unprofitably slow
today!



Model ML, designed for carbon blade only.



THIS IS A
TYPICAL DoALL STORE

The DoALL Company, Des Plaines, Illinois



New Production Ideas

Equipment, Methods and Services

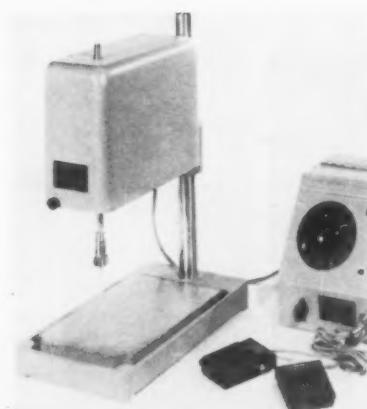


Induction Melting Unit Installs Quickly

Rapid installation is a key feature of this complete induction melting unit. A console panel contains power source, controls and all components necessary to operate high-frequency furnaces and coils. The unit features a 30-kw motor-generator set, a compact high-frequency transformer, capacitors, meters and controls. Shipped completely assembled, the unit installs simply by connecting it to a 220 or 440-v power supply, a cold water line and a drain. Various fur-

naces or coils quickly connect to the unit via leads which supply both power and cooling water. The unit can be made portable simply by mounting it on casters. It then can hook up to wherever adequate power and water are available. Recommended uses: floor-mounted furnaces to 100-lb capacity, hand-pour furnaces, vacuum furnaces, sintering and hot pressing. (Inductotherm Corp.)

For more data circle No. 44 on postcard, p. 105

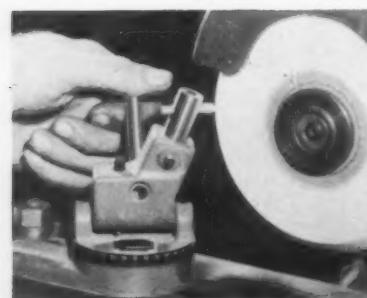


Unskilled Operator Works Tapping Machine

Small-hole tapping can be done by an unskilled operator with this automatic unit. The multiple pitch, automatic lead screw tapping machine works by a footswitch or pushbutton. In an automated manufacturing process the operator is replaced by suitable work-handling equipment; the workpiece itself then actuates the tapping cycle. Tap feeds and retracts at a controlled rate governed by only one master precision lead screw. Yet it covers

the entire range of standard pitches from 32 through 320 threads per inch in tap sizes No. 000 through No. 10. Changeover from one pitch to another takes about 90 seconds. An adjustable friction clutch allows precise control of tap torque. Tap stroke adjusts from $\frac{1}{8}$ to 2 in. Speed is infinitely variable. Cycle rates can reach 3000 per hour. (Milman Engineering Co.)

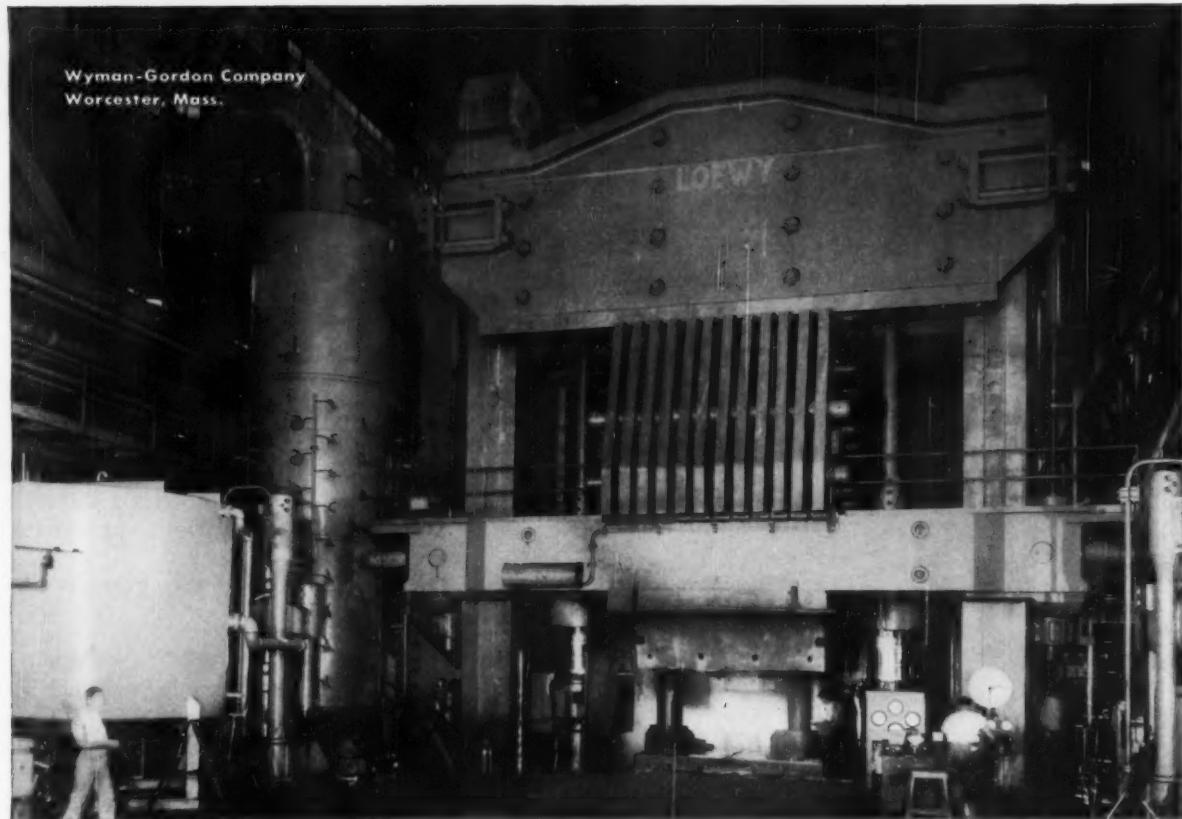
For more data circle No. 45 on postcard, p. 105



Low-cost Unit Dresses Tools Quickly, Easily

Safe, fast angle dressing of tools and cutters is done by this economical angle dresser. For use in tool and cutter grinding, form tools, cylindrical and surface grinding, the setup's dressing action is obtained by rocking between center. Abrasive dust is no detriment to dressing motion since centers

do not admit dust. They have a take-up to acquire a snug "feel." Sticking, jerky or loose, chattering motion is eliminated, resulting in fine micro-finishes. Adaptable to virtually any grinder, it can be left on the machine; it hinges down out of the way to prevent collision with the grinding wheel. Operator's



Operation Big Squeeze: World's largest presses lubricated by Cities Service Pacemaker Hydraulic Oils

Once a forging operation for horse-drawn carriages, Wyman-Gordon Company now operates the world's largest presses, with the newest one capable of exerting 50,000 tons pressure.

Reason for this tremendous press is the increasing need for strong, lightweight metal parts for aircraft. Today, as for many years, no military or transport aircraft takes to the air without Wyman-Gordon forgings.

With its huge, hydraulically operated presses, Wyman-Gordon is able to forge huge pieces with one big squeeze. Sometimes a whole unit for a landing-gear strut. Or one mammoth wing spar.

The press that exerts 50,000 tons pressure is described by Wyman-Gordon as "the largest single machine ever conceived"—and few people would argue the point after seeing it.

Mounted in a pit that extends nine stories beneath the earth, the giant press is over 114 feet high and weighs 10,605 tons, 6,450 of which moves up and down.

Cities Service is justifiably proud that here as in all of Wyman-Gordon's presses with 18,000 tons pressure or better, hydraulic lubrication is provided by Cities Service Pacemaker Oils.

It is hardly necessary to point out the incredible demands that such machinery makes of its hydraulic lubricants... and certainly it is self-evident that if Cities Service Pacemaker Oils can perform satisfactorily in the world's largest presses, they'll do the same for you. Talk with a nearby Cities Service Lubrication Engineer. Or write: Cities Service Oil Co., Sixty Wall Tower, New York 5, N.Y.



Entire Rig Is Operated by One Man with the few simple controls shown here. With a flick of his fingers he can put on a squeeze of 50,000 tons. Result is extremely strong lightweight forgings for aircraft.



Lubrication Foreman has mammoth responsibility. Here, he checks dispenser for Cities Service EP 20 Lubricant... used on main bed and columns of large presses and other areas subject to extreme pressures.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

STEEL WAREHOUSE "TAKES TO THE AIR"



Fig. 1 — TRAK-RAK fork lift at top of column, lifting bundle of steel rod. Unit serves 3 long aisles of racks.

TRAK-RAK SYSTEM INCREASES STORAGE SPACE, SAVES 22% CAPITAL BUILDING INVESTMENT

When A. C. Leslie & Co. Limited, needed more storage area in its busy Toronto steel warehouse, it decided to "reach for the ceiling" with a Chicago Tramrail TRAK-RAK System of vertical storage and handling. As a result, the company estimates it not only saved 22% of projected capital building costs, but increased the overall efficiency and speed of the Toronto operation. The company expects to gain further economies as the TRAK-RAK system is used to its full extent.

A 5 ton capacity toprunning TRAK-RAK Crane was installed in each of two 40 ft. wide bays to serve specially designed 18 ft. high material storage racks (Fig. 1). Each crane bridge has an overhead trolley, from which is suspended an electrically operated rotating column

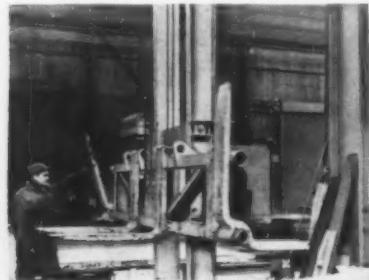


Fig. 2 — Carriage equipped with 2 pairs of forks. Operator is flopping outer forks up.

equipped with a special fork lift. All operations of the fork lift, which revolves to serve either side of the aisles, moves toward or away from the racks, and raises or lowers on the column, are controlled by the operator who rides with the carriage.

Two pairs of forks are mounted on the carriage. The outer forks may be flopped back (Fig. 2) leaving the inside forks in

position for handling palletized or crated material. For handling long boxes, bars, etc., the outside forks are flopped back into working position.

A TRAK-RAK feature which added to handling speed and insured safe operation was the safety interlock switch system which prevents the column from running



Fig. 3 — TRAK-RAK column requires minimum aisle space for operation.

into a rack and permits full rotation only when the unit is safely beyond the end of the racks.

The A. C. Leslie Company reports that a similar TRAK-RAK System installed in its Montreal warehouse permitted a 37% savings in capital building investment with equally good operating efficiency and economy.

For complete details on the TRAK-RAK System of vertical storage and handling, write the manufacturer:

 CHICAGO TRAMRAIL
CORPORATION
1312 S. Kostner Avenue • Chicago 23, Ill.

NEW EQUIPMENT

hands never get near the grinding wheel. The dresser, with graduated base, also locks in fixed position for dressing horizontally or under the wheel with the slide movements of the machine itself. (Steptool Corp.)

For more data circle No. 46 on postcard, p. 105

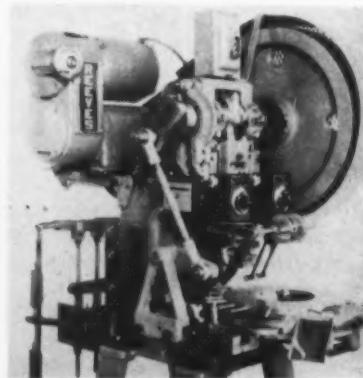
Radiation Monitor

A new nuclear radiation ratemeter and laboratory monitor is an ac-operated count ratemeter with an attached thin window geiger detector. A variable volume loud speaker provides audible indication of activity being counted. (Tracerlab Keleket).

For more data circle No. 47 on postcard, p. 105

Hot Stamper

This hot stamping machine has two marking heads. Driven by a variable speed motor, it uses an improved dial feeding system. Individual dwell and pressure controls for each head permit marking of two separate colors at the same



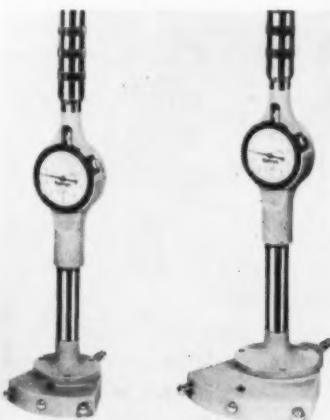
time. Each head is self leveling. Generally hand fed, automatic feed is possible where items being marked lend themselves to automatic positioning. With 20 stations, the dial feed is easy to load. Speeds to 4500 parts per hour are feasible depending on the operator. (The Acromark Co.)

For more data circle No. 48 on postcard, p. 105

Bore Gages

For inspection or checking hole sizes during machining or grinding,

new dial bore gages measure bore diameter in ten-thousandths or half-thousandths, depending on the model. They indicate variations from true bore such as taper, out-of-round, bell mouth, hour glass or barrel shape. Three sizes cover a range of 3 to 12½ in. Six models give a choice of indicator readings



in 0.0001 or 0.0005 in. An aluminum handle, indicator housing and gaging head provide light weight and easy handling. Gaging contact, centralizing plungers and range extension screws are normally hardened and tempered tool steel but carbide tips are available on special order. (L. S. Starrett Co.)

For more data circle No. 49 on postcard, p. 105

Furnace Brick

Dense and hard-burned, a new refractory brick serves where contact with molten metal and slag require very high resistance. For use where excessive temperatures are met and increased volume stability is required, the brick has uses as hot metal mixer linings, sidewalls and bottoms of air furnaces, and similar applications. (J. H. France Refractories Co.)

For more data circle No. 50 on postcard, p. 105

Facing Head

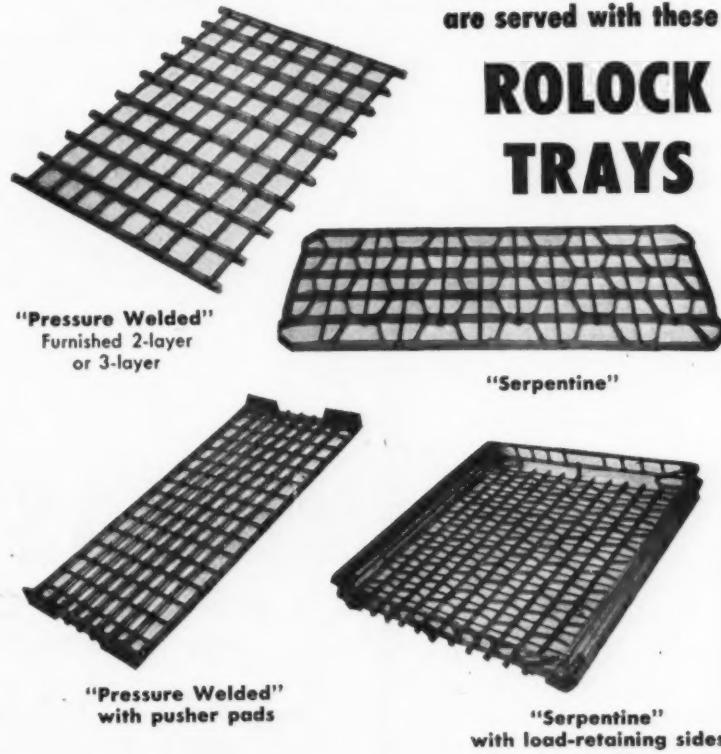
An adjustable blade plunge-facing head performs precision boring and facing or spot facing of wide surfaces without need for special tooling. It's especially designed for all makes of boring machines, turret lathes and heavy drilling equipment. The tool quickly installs and

ROLLOCK
FABRICATED ALLOYS
HEAT AND CORROSION RESISTANT

SILVER PLATTER SAVINGS

are served with these

ROLLOCK TRAYS



ROLLER HEARTH FURNACE users have found these two basic Rolock Tray designs . . . and many possible variations . . . at once efficient and economical.

Not only can Rolock design and construction reduce tray weight (often by 25% to 50%) and thus increase pay-load, but service records frequently show that tray life has doubled or tripled.

These worthwhile savings have resulted from Rolock's engineering approach to tray design, taking into consideration details of the furnace hearth, tray load and weight ratios, method of operation, temperature limits and gradients and many other factors.

Complementing correct design, Rolock's unique "Serpentine" and "Pressure-Welded" construction features have proved to be, in many installations, the answer to problems of rapid tray deterioration. That is why Rolock today is a major supplier of furnace trays of these and many special types.

Why not make your own test. Let Rolock design and build your next replacements.

SALES AND SERVICE REPRESENTATIVES FROM COAST TO COAST

ROLLOCK INC., 1362 KINGS HIGHWAY, FAIRFIELD, CONN.

JOB-ENGINEERED for better work
Easier Operation, Lower Cost

101.00

Hyde Park RAMS

for all types of
**HYDRAULIC
EQUIPMENT**

Hyde Park Rams are available in Chilled or Alloy Iron. Furnished in hardness range to meet your specification . . . ground to your required size. On your next replacement of Rams—or for new equipment—consult us. Our engineers will be glad to assist you.

Red Circle Rolls for every Purpose
Rolling Mill Equipment
Gray Iron Castings up to 80,000 lb.

Hyde Park
FOUNDRY and
MACHINE CO.
HYDE PARK
Westmoreland County, Pa.

Rolls
Rolling Mill Equipment
Gray Iron Castings

NEW EQUIPMENT

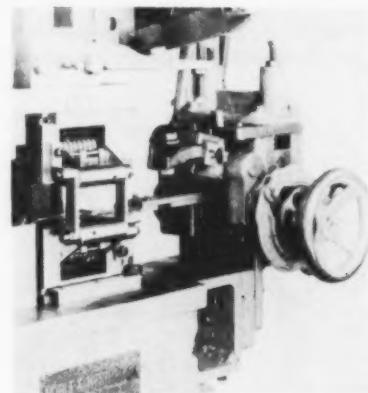
adjusts to accurately machine from 1½- to 8½-in. diam surfaces. In many instances, this plunge facing eliminates generating a face by slow cross-feed methods. High speed steel or carbide blades in a wide range of sizes can be readily interchanged or replaced. (DeVlieg Microbore Div., DeVlieg Machine Co.)

For more data circle No. 51 on postcard, p. 105

Metal-tag Embosser

Embossed identification tags are produced on this machine. From brass wire stock, it automatically turns out predetermined quantities up to 3000 tags an hour. Built around a standard 10-ton back geared press with roll feed, it consists of a multi-station die set. This includes a male and female em-

bossing head which stamps a raised or formed impression in the tag. The head advances consecutively with each press stroke. The die set also includes a hole punch and parting dies. These produce a com-



plete tag with oval ends. Tags go directly into a pneumatic stacking chute making it possible to remove them in consecutive order. (Noble & Westbrook Mfg. Co.)

For more data circle No. 52 on postcard, p. 105

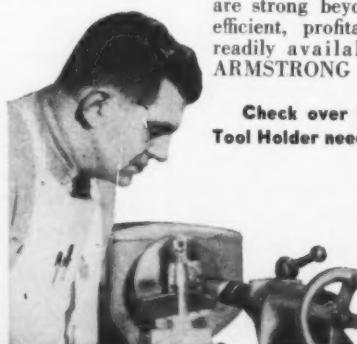
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A Correct Tool for Every Lathe Operation

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For more data circle No. 53 on postcard, p. 105

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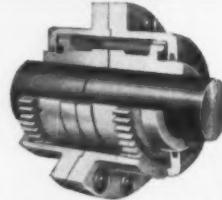
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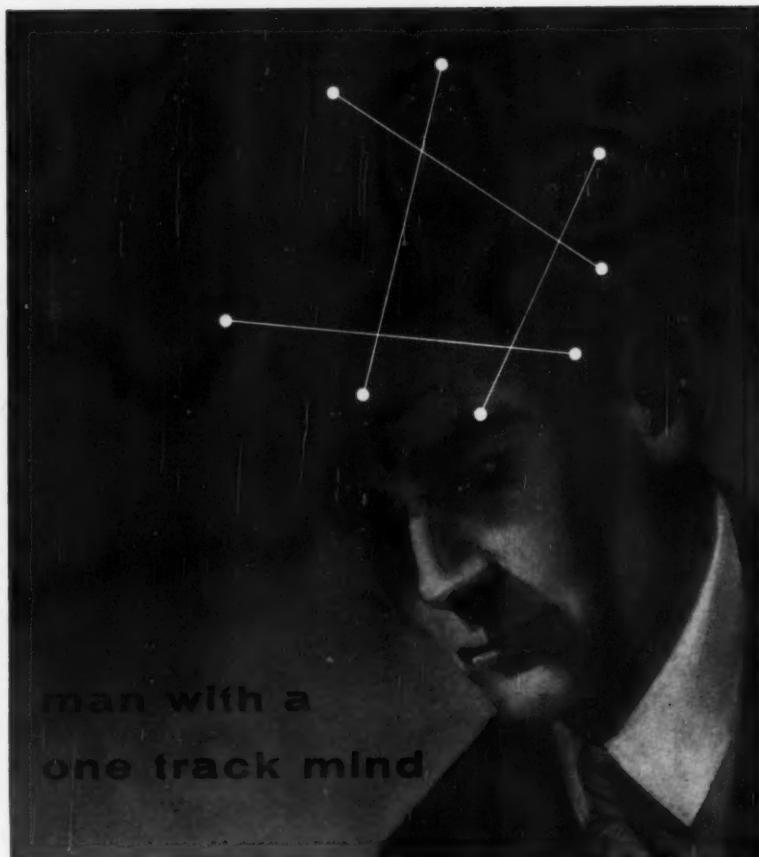
NEW BOOKS

"Manufacturing Processes . . . Production" shouldn't be confused with "Manufacturing Processes" and "Manufacturing Methods & Processes." Published by John Wiley & Sons and Chilton Co. respectively, the latter two include material on plastics, welding, etc., though mostly metals. The new work, however, covers just machine shop and metal processing setups. Chapters cover: general tools; thread cutting; screw machining; milling, drilling, boring and reaming; shapers, slotters and planers; metal sawing and metal filing; broaching; gear making; grinding and finishing; inspection, quality control; and chipless production. 560 pp. \$7.25 per copy. American Technical Society, 848 E. 58th St., Chicago 37, Ill.

"Mathematics For Industry" has three features which make it a candidate for any size technical library. These are: low price, compactness, an excellent index. Presenting math most often used by engineers and shop men, it considers problems dealing with latest machine shop and production methods, in addition to shop-worn methods. Best of all you needn't be an M. E. to use it. 565 pp. \$6.25 a copy. American Technical Society, 848 E. 58th St., Chicago 37, Ill.

"Developing & Evaluation of Insulating-type Ceramic Coatings: Part 1 — Development & Small Scale Testing" covers metal-reinforced refractory coats for protecting missile alloys. They serve to 3000°F. 98 pp. PB 131752. \$2.50 per copy. Office of Tech. Surveys, U. S. Commerce Dept., Washington 25, D. C.

"Zone Melting" overflows on a subject which can change tomorrow's metalmaking processes. Its author is W. G. Pfann, researcher for zone-refining pioneer Bell Telephone Labs. The book tells how



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NEW BOOKS

melting a small zone and moving this along gives ultra-pure materials. In theory, zone melting can revolutionize steel and alloy making. It might increase demands for atomic and solar generated power for electric zone-refining furnaces. And it could even be a way of economically turning salt water to pure. However, this is no book

of theories; facts abound. 236 pp. \$7.50 per copy. John Wiley & Sons, 440 4th Ave., New York 16.

"**Phosphoric Acid**" gives safe handling tips on this metal cleaning material. 30¢ per copy. Mfg. Chemists Assn., 1625 Eye St., N.W., Washington 6, D.C.

"**How to Supervise People**" discusses handling of personnel, hiring through firing. Among other things,

this 4th edition ponders automation and psychological stress. A piece on delegating authority even suggests how the reader can find time to read the book. 264 pp. McGraw-Hill Book Co., 327 W. 41st St., New York 36.

"**Dillon Dynamometers at Work in the World**" may clear up some fuzzy ideas about dynamometers and their uses. The instrument maker which publishes it says it cost about \$5 a copy to make and compile. 81pp. 50¢ per copy. W. C. Dillon & Co., P. O. Box 3008, Van Nuys, Calif.

"**Knurling**" is a revised American Standard B5.30. Its joint sponsors are: ASTE, MCTI, NMTBA, SAE and ASME. \$1.50 per copy. American Society of Mechanical Engineers, 29 W. 39th St., New York 18.

"**A Manual of Processes for Cold Bending Metals & Abrasive Cut-Machining of Metals**" comes in two sections. Bending section costs \$2.20; cutting section, \$2.20. Complete book: \$3.30 per copy. 200pp. 148 pictures. Wallace Supplies Mfg. Co., 1300 Diversity Pky., Chicago 14, Ill.

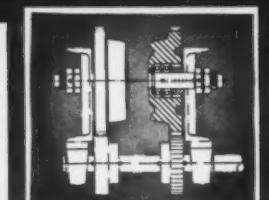
"**Production Handbook**" combines efforts of 48 production, management and engineering men. Edited by G. B. Carson, Dean, Engineering College, Ohio State University, it tries to help production specialists keep output up, costs down. In its second edition, it presents late data on computers, research, development, statistical methods, etc. 1700 pp. 725 illustrations. \$16 per copy. Ronald Press, 15 E. 26th St., New York 10.

"**Automatic Control: Principles & Practice**" has a magic title. It can cast a sort of spell over production men and machinery operators. Ever thirsting for more on automation, they impulsively pick up the book and flip through its pages. A quick look disenchants the



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lay reader, separating the control men from the boys. Well edited and well prepared, it's good reading for those in the field. Novices would have to apply themselves to get anything. 258 pp. \$7.50 per copy. Reinhold Publishing Corp., 430 Park Ave., New York 22.

"5-minute Safety Talks for Foremen—Book 8" can give your foremen a year's material for weekly safety meetings, off-the-cuff pep talks, or briefing new workers. A quarter million such books have been used by supervisory and safety personnel. \$1.95 per copy (volume prices considerably less). National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

"Safety in Welding and Cutting" argues fire prevention, fuel and oxygen handling, personnel safety,

etc. \$2 per copy. American Welding Society, 33 W. 39th St., New York 18.

"Ore Microscopy" contains more than 200 sketches and charts, telling how new techniques figure quantitative analysis within ± 0.01 pct. \$10 per copy. Sturm & Smith, P. O. Box 4063, University Station, Tucson, Ariz.

"Magnesium Tooling Plate Shop Manual" has 55 pages. Dow Chemical Co., Magnesium Dept., Midland, Mich.

"Recommended Safe Practices for Inert-gas Metal-arc Welding" is a second edition. \$1 per copy. American Welding Society, 33 W. 39th St., New York 18.

"Castilla's Spanish & English Technical Dictionary" attempts to fill two infinite voids. First, like other Spanish-English, English-Spanish reference works, it bridges

the language chasm. This it does without imitating an encyclopedia. The second void, covering the technical field between lay and scientific language, grows too fast for any dictionary. For normal technical correspondence, it suffices, however. It excludes highly scientific, little used terms and includes some commercial and legal ones. There's been a rush lately to learn Russian. Others want to teach customers English. But it's well to recall that nearly a fourth of the world's population speaks Spanish. 1611 & 1137 pp. \$45 per set. Philosophical Library, 15 E. 40th St., New York 16.

"The Calculation of Load & Torque in Hot Flat Rolling" has 109 pages; 96 contain full-page graphs of stress-strain curves of necessary "mean yield strength" data for 12 steels at 900, 1000, 1100 and 1200°C, at usual deformation environments. More charts give other data. \$3.90 per copy (postpaid). British Iron & Steel Research Assn., 11 Park Lane, London W1, England.

"Preprint Book" and **"Proceedings"** sum up a big conference of a society's reinforced plastics division. The first gives 72 talks of a technical and management conference. The other supplies questions and answers of 16 separate sessions. Building, boats, tooling, premix materials, preforming, high temperatures, and new materials are covered. 627 pp (**Preprint Book**). \$7 per both volumes. Society of the Plastics Industry, 250 Park Ave., New York 17.

"Machine Pins" is a new American standard. ASA B.5.20-1958. 16 pp. \$1.50 per copy. American Society of Mechanical Engineers, 29 W. 39th St., New York 18.

"Investment Casting Engineering & Designing Manual" is a second edition of a May 1957 publication. \$2 per copy. Investment Casting Institute, 27 E. Monroe St., Chicago 3, Ill.

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The Iron Age Summary

Steel Buyers Fight for Position

As the market tightens, more buyers join the scramble for a spot on mill orders books.

Mills could be operating at near-capacity in the second quarter if orders continue to mount as in last several weeks.

■ Steel users are jockeying for position on mill order books. The mills are doing their best to fit everybody into ever-tightening rolling schedules, but it's not easy.

"The way orders are pouring in, it's as though someone had opened the flood gates," a harassed steel sales executive said this week.

Order Screening — More mills are "screening" new orders in what amounts to an informal system of allocation. The mills are trying to give all steel users a chance to stock up before a possible steel strike next July 1.

"We're fitting some customers in with a shoehorn," said one mill. "We can't always give them what

they want, but we're putting them on the rolling schedule in what open space is still available."

Buyers Push for Delivery — Most buyers are asking for delivery by May or earlier—and with good reason. Even the mills are reluctant to take orders for June delivery. The reason for this is the fear that order carryovers from May to June will be so heavy that June orders will be washed out.

If order volume continues to mount as it has during the last several weeks, the mills could be operating at near-capacity in the second quarter. Marginal melting furnaces—the ones that are not so efficient as the newer furnaces—are being brought into production at several mills. These furnaces are started up only when it becomes absolutely necessary.

Scramble Broadens — More small and medium-size steel users are scrambling to protect their inventory position. In the process they are trying to increase their "normal"

share of available products. In sheets, for instance, they are trying to boost their tonnage from a "normal" one-third to a second-quarter two-thirds.

"In this situation," says one mill product manager, "total demand adds up to more than 100 pct of sheet capacity. Obviously, something's got to give."

Plate Market Tightens — As a result of the demand buildup, more steel products are entering the hard-to-get category. These include hot-rolled sheets and strip, and plate. Plate has been on allocation in the Midwest for several weeks, but it's now approaching that stage in Pittsburgh. Mills there are telling customers plate will be on allocation in the second quarter.

Still relatively easy to get are oil country casing and tubing, linepipe, and rails. Standard structural shapes are showing improvement but are still on the easy side. Demand for wide flange beams is much stronger.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week	Last Week	Month Ago	Year Ago
	2,278	2,179	2,094	1,457
Ingot Index (1947-1949=100)				
	140.9	135.7	130.4	90.7
Operating Rates				
Chicago	90.0	88.5*	79.0	58.0
Pittsburgh	76.0	76.0*	70.5	58.5
Philadelphia	85.0	81.0*	71.0	62.0
Valley	64.5	59.0*	71.0	45.0
West	86.0	86.0	80.0	63.0
Cleveland	86.0	84.0*	81.0	36.0
Buffalo	100.0	78.0	66.0	51.0
Detroit	70.0	83.0*	97.0	53.0
South	72.5	72.0	71.0	54.0
South Ohio River	94.0	89.0*	82.0	41.0
Upper Ohio River	82.5	81.0*	86.0	58.0
St. Louis	87.0	95.0*	90.0	74.0
Aggregate	80.5	77.0	74.0	54.0

*Revised

Prices At a Glance

	This Week	Week Ago	Month Ago	Year Ago
(Cents per lb unless otherwise noted)				
Composite price				
Finished Steel, base	6.196	6.196	6.196	5.967
Pig Iron (gross ton)	\$66.41	\$66.41	\$66.41	\$66.42
Scrap No. 1 hvy (Gross ton)	\$43.83	\$42.50	\$40.17	\$37.33
No. 2 bundles	\$30.33	\$29.33	\$29.33	\$29.17
Nonferrous				
Aluminum ingot	26.80	26.80	26.80	28.10
Copper, electrolytic	30.00	29.00	29.00	25.00
Lead, St. Louis	11.80	11.80	12.80	12.80
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	101.00	99.875	98.25	93.00
Zinc, E. St. Louis	11.50	11.50	11.50	10.00

Foundry Equipment Sales Climb

This year will bring a strong sales comeback, foundry equipment makers predict.

Buyers warned price increases are probably coming.

■ Foundry equipment builders and suppliers expect a strong comeback this year but not a boom.

Basically there's nothing wrong that a boom in the parent foundry industry won't cure. And predictions are hinged largely on the foundry outlook.

Price Boost Due—Pricewise most suppliers feel an increase this year is inevitable due to outside increases in labor and freight rates.

In a recent survey members of the Foundry Equipment Mfrs. Assn. said they expect 1959 to show a heavy increase in equipment sold compared to 1958. But they do not believe the year will reach

1957 levels.

Late '58 Upturn—“Through August of last year our sales were down 35 pct from 1957,” says Einar Borsh, Cleveland, vice president of the association. In the fourth quarter they turned up somewhat. Based on a 1947-49 production index of 100, net orders closed jumped from a 64 index in September last year to 118 in October. Then they settled to 85 for November.

“We all sincerely wish foundrymen would take advantage of low activity periods to overhaul their shops and install new equipment when there is a minimum of interruption,” says Mr. Borsh.

Special Jobs Help—Heavy equipment makers like Osborn Mfg. Co. of Cleveland are living off special engineering jobs, waiting for the standard equipment market

to come to life again. Leon F. Miller, vice president, says about 80 pct of equipment now being built must be specially engineered to fit existing flasks, shakeouts, molds, and other equipment even though cost of engineering runs high.

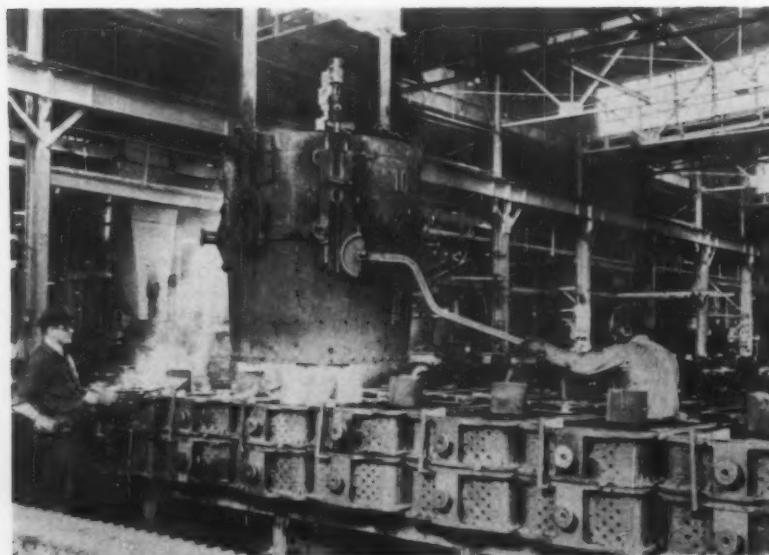
“Our best market right now is for mechanization of handling equipment for flasks, molds, and shakeouts,” says Mr. Miller. “This is because foundries get an immediate return on this investment and so are a little more willing to put out the money.”

Outlook for Osborn in the first half of 1959 is considerably better than the same period last year but not up to expectations, according to Mr. Miller. Repair business, a good straw in the wind, is picking up. Special engineering jobs are filling the gap until standard equipment starts to move again.

Foundry Supply Outlook—In the allied foundry supply field, the outlook seems just as good or slightly better than in machinery and equipment. Sales during January were the highest since the beginning of the recession for National Metal Abrasive Co., Cleveland, of which Mr. Borsh is also vice president.

Sales of shot blasting supplies are on the increase, according to Mr. Borsh, because foundries are finally buying more than they are using and total use has gone up. The corner was turned in September when orders jumped 50 pct over the recession low.

Prices will also go up—probably about 5 pct—in the first 6 months of the year due to outside increases in freight and labor according to Mr. Bishop.



BETTER OUTLOOK: Foundry equipment sales this year should be better than in 1958, manufacturers say. (American Steel Foundries photo.)

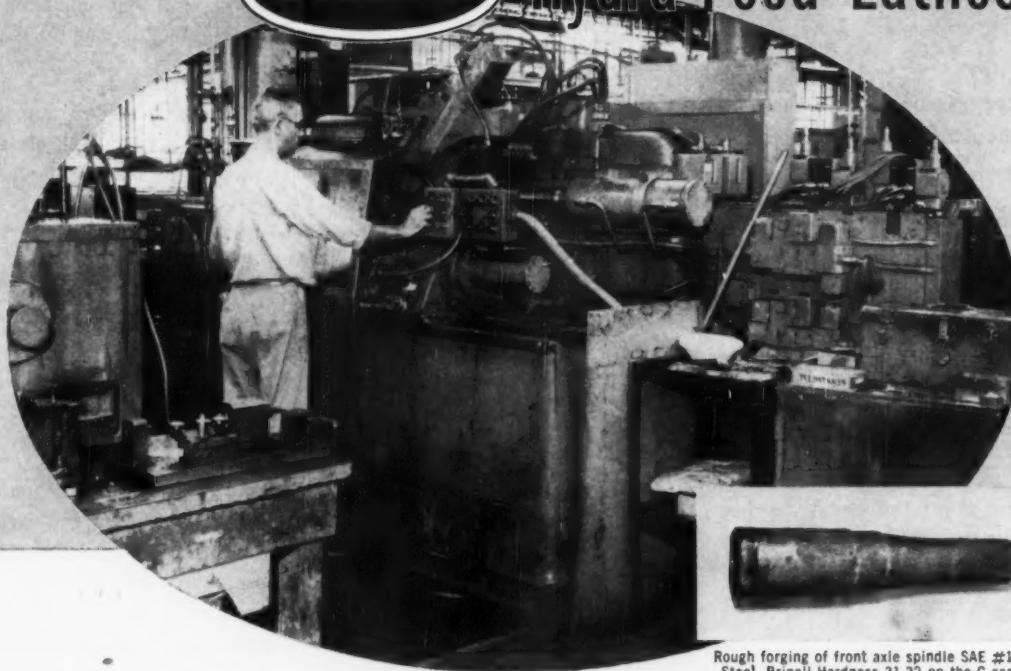


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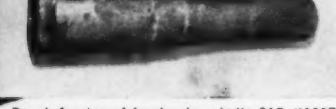


The Senior Engineer at one of the leading motor car manufacturers in Detroit, was looking for a tracer lathe that went beyond his immediate requirement and offered easy conversion to other uses in years to come, to give longest tool life, to do the job with a minimum of shutdown time, to handle future developments in the realm of cutting tools, to reduce scrap to a minimum.

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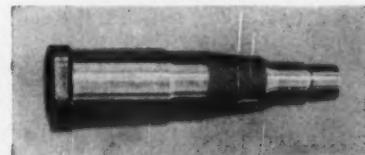
Rough forging of front axle spindle SAE #1037 Steel, Brinell Hardness 31-32 on the C scale.



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Hedge Buying Boosts Plate Demand

Orders for plate take sharp upturn as buying wave spreads to Pittsburgh and East Coast mills.

Producers work out systems of allocating second quarter tonnages.

■ Plate is rapidly joining sheet and strip on the "best seller" list.

Demand has been heavy in the Midwest for weeks where buyers are now on a quota system. But the order surge is moving eastward.

During last week the plate market at Pittsburgh "caught fire," according to mill sources. Orders are coming in at a rate labeled "impossible" by one sales official. As a result, sheared plate bookings there are closed out through February. And second quarter orders are increasing.

The light plate market is also tightening. One reason: Strip mills are too busy for light plate rollings. A Pittsburgh producer has advanced light plate deliveries from four to six weeks.

Mills along the East Coast have also felt the buying upturn. Bookings are better and deliveries are moving out slightly. But this is the main problem for mills: How to handle second quarter bookings?

"We don't want to use a quota system," says a mill sales manager, "but we also don't want to leave our regular customers out in the cold."

Generally Eastern producers are going in for some type of "informal allocation" on April-June tonnages. One mill has given definite sales

quotas to district offices. Another won't accept any orders beyond a forty-five day lead time.

Structurals—Buyers are still resisting any large-scale move to build up inventories. Even at Chicago, where most products are in strong demand, structural mills can give five week delivery. Standard shapes, while showing improvement, are still below normal. Orders for wide flange beams are a little better. Steel service centers are stocking up on light structurals.

Sheet and Strip — Hot-rolled sheet is in greater demand. One Pittsburgh mill is booked solid through March on both hot- and cold-rolled sheet. More orders are coming from automotive, appliance, and service center buyers. But the greatest pressure is from miscellaneous users. Many want to boost second quarter tonnages substantially.

Hot-rolled sheet mills at Chicago are operating 21 turns a week. Some cold-rolled deliveries there are six weeks behind promises.

PURCHASING AGENT'S CHECKLIST

Magnesium fabricators expect good sales year. P. 43

Farwest missile makers diversify by turning out more industrial products. P. 61

Machine tool builders urge government to change policy on tax depreciation. P. 63

Midwest mills say strip demand is also moving up. One mill there booked tonnages well into May in the last ten days.

Bar—Deliveries in the Midwest are beginning to stretch out. Mills are now on 60-day rolling cycles for nearly all products in the 10-inch size range. Annealing space is a critical factor in cold finishing operations. New orders for bar needing annealing may take as much as 90-120 days for delivery. This is not general, but annealing backlog are building up rapidly.

Pipe and Tubing—Second quarter demand for oil country seamless is growing. But mills are operating right now at about 50 pct of capacity. They will stay at that level unless February-March orders improve.

Demand for large diameter line-pipe has increased. Smaller sizes are still not moving well. Standard pipe remains on out-of-stock delivery.

Tinplate—Shipments are climbing steadily. In most market areas they are reaching the level of top mill production. Shipments in the south are beyond mill capacity. Canmakers are growing more insistent about getting in tinplate supplies.

Stainless—Order volume continues to grow. However, unlike other products, stainless is not feeling much demand from hedge buying. Users are still ordering on a short range basis. Mill bookings usually only extend into March.

Marginal Furnaces Lighted—After a shutdown lasting almost a year, U. S. Steel has re-opened openhearth shop No. 4 at its Homestead District Works. Seven furnaces in the 14-furnace shop will be relighted with employment for several hundred furloughed employees. Steel output—about 15,000 tons a week—is needed to fill current orders.

COMPARISON OF PRICES

(Effective Feb. 3, 1959)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	Feb. 3 1959	Jan. 27 1959	Jan. 6 1959	Feb. 4 1959
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10 ^f	5.10 ^f	5.10 ^f	4.925 ^e
Cold-rolled sheets	6.275	6.275	6.275	6.05
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.60
Hot-rolled strip	5.10	5.10	5.10	4.925
Cold-rolled strip	7.425	7.425	7.425	7.17
Plate	5.30	5.30	5.30	5.12
Plates, wrought iron	13.55	13.55	13.55	13.15
Stainl's C-R strip (No. 302)..	52.00	52.00	52.00	52.00

Prices Climb, Pressure Continues

The new direction scrap prices are taking is a refreshing change for the trade.

There is no letup in strength and the outlook is for still higher prices in the weeks ahead.

■ Scrap prices soared again this week in most districts and the top is not yet in sight.

Responsible for the latest round of increases was a solid surge in industrial scrap buying. Dealer openhearth scrap prices moved upward in sympathy with the factory lists in most cases, though at a slower rate.

Leading the parade was a sale of factory bundles in Pittsburgh at \$54, a jump of \$4 over the last price. Other increases were reported in Cleveland, Chicago, and Detroit. While few significant sales of primary dealer grades were made to mills during the week, some brokers were beginning to lay it down in their yards.

Prospects are strong that dealer material will be moving in quantity soon. The supply of highly desirable industrial scrap is spreading thin and mill operating rates are still climbing. Optimism among dealers is greater than it has been for over a year.

Based on increases in three major markets, The IRON AGE No. 1 heavy melting Composite Price moved up \$1.33 to \$43.83.

Pittsburgh — Prices of industrial grades skyrocketed this week as mills sought to punch up production with the best scrap. Local factory bundles were sold to a mill for

\$54—a jump of more than \$4 over last month. Dealer openhearth grades were pulled up \$1-\$2 by this and by prices in a nearby district. The advance in dealer prices came even though users are still picking up small tonnages at low prices.

Chicago—Scrap broke upward at the broker buying level last week and has grown progressively tighter. Following stronger sales in electric furnace and cast grades, the entire market began moving up at the consumer level despite efforts of mills to hold the price line. The uptrend was triggered by sales of factory bundles at on-track prices of \$48-\$49. Last week's price for No. 1 heavy melting was a misprint and should have read \$43-\$44; No. 1 busheling should have read \$43-\$44, and No. 1 factory bundles should have read \$47-\$48.

Philadelphia—Openhearth scrap prices rose \$1 on bases of sales to two local consumers. Two prices were paid for No. 2 bundles, making a spread of from \$25 to \$27. Foundry activity brought higher prices for some cast grades. New export orders may be coming soon.

New York—Both openhearth and stainless solid grades are stronger. Openhearth grades are up \$1 to a top of \$30 for No. 1 heavy melting, mainly on the basis of buying by eastern Pennsylvania mills. Some material is reported still moving by truck to Pittsburgh.

Detroit—Dealers have their fingers crossed, hoping that yard scrap will show some activity this month

and keep pace with industrial scrap movement. No. 1 industrial bundles averaged around \$45-\$46 last week and out-of-state material would figure even higher on the local market.

Cleveland—Market is starting to open up due to increased steelmaking for the auto industry. Several Valley purchases have been made and Cleveland auto lists are \$4 to \$5 above a month ago. Dealer market is up \$2 and should go higher as industrial scrap becomes exhausted. One Valley mill made an early purchase for \$49 and some special electric furnace lots are bringing up to \$51 a ton.

St. Louis—Steel scrap prices are strong and trading is active. On the latest railroad list, No. 1 railroad heavy melting was sold at \$46.

Birmingham—Prices for No. 2 openhearth scrap increased \$2 a ton this week, the closest to No. 1 it has been in years. Reason for the lag in No. 1 is lack of buying by mills.

Cincinnati—Upriver market is starting to give local mills some competition for scrap. A slight rise over current prices seems certain. Secondary grades are starting to move and may be followed shortly by primary material. Area mills are in the market for the month with normal buys.

Buffalo—Sales of No. 1 and No. 2 items are expected soon at higher prices. Prices of all grades except cast moved upward \$2 in anticipation of these sales.

Boston—Steelmaking grades rose \$2 a ton this week on the basis of small purchases and a stronger market tone.

West Coast—No one looks for price changes in February. The mills are taking in little scrap as the market continues quiet. Most of what is moving is going to export.

Houston—The district mill raised its prices for No. 1 and No. 2 heavy melting grades in an effort to prevent these grades from moving out of the area.



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SCRAP PRICES (Effective Feb. 8, 1959)

Pittsburgh

No. 1 hvy. melting	\$47.00 to \$48.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 dealer bundles	47.00 to 48.00
No. 1 factory bundles	53.00 to 54.00
No. 2 bundles	33.00 to 34.00
No. 1 busheling	47.00 to 48.00
Machine shop turn.	25.00 to 26.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	29.00 to 30.00
Low phos. punch'gs plate	52.00 to 53.00
Heavy turnings	39.00 to 40.00
No. 1 RR hvy. melting	50.00 to 51.00
Scrap rails, random lgth.	55.00 to 56.00
Rails 2 ft and under	58.00 to 59.00
RR specialties	53.00 to 54.00
No. 1 machinery cast	51.00 to 52.00
Cupola cast.	45.00 to 46.00
Heavy breakable cast	43.00 to 44.00
Stainless	
18-8 bundles and solids	225.00 to 230.00
18-8 turnings	120.00 to 125.00
430 bundles and solids	125.00 to 130.00
410 turnings	50.00 to 60.00

Chicago

No. 1 hvy. melting	\$44.00 to \$45.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 dealer bundles	44.00 to 45.00
No. 1 factory bundles	49.00 to 50.00
No. 2 bundles	31.00 to 32.00
No. 1 busheling	44.00 to 45.00
Machine shop turn.	24.00 to 25.00
Mixed bor. and turn.	25.00 to 26.00
Shoveling turnings	26.00 to 27.00
Cast iron borings	26.00 to 27.00
Low phos. forge crops	56.00 to 57.00
Low phos. punch'gs plate	
½ in. and heavier	52.00 to 53.00
Low phos. 2 ft and under	50.00 to 51.00
No. 1 RR hvy. melting	47.00 to 48.00
Scrap rails, random lgth.	53.00 to 54.00
Rerolling rails	64.00 to 65.00
Rails 2 ft and under	60.00 to 61.00
Angles and splice bars	55.00 to 56.00
RR steel car axles	72.00 to 73.00
RR couplers and knuckles	51.00 to 52.00
No. 1 machinery cast	56.00 to 57.00
Cupola cast.	49.00 to 50.00
Cast iron wheels	44.00 to 45.00
Malleable	58.00 to 59.00
Stove plate	46.00 to 47.00
Steel car wheels	53.00 to 54.00
Stainless	
18-8 bundles and solids	220.00 to 225.00
18-8 turnings	120.00 to 125.00
430 bundles and solids	120.00 to 125.00
430 turnings	60.00 to 65.00

Philadelphia Area

No. 1 hvy. melting	\$39.00 to \$40.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 dealer bundles	40.00 to 41.00
No. 2 bundles	25.00 to 27.00
No. 1 busheling	40.00 to 41.00
Machine shop turn.	21.00 to 22.00
Mixed bor. short turn.	22.00 to 23.00
Cast iron borings	22.00 to 23.00
Shoveling turnings	24.00 to 25.00
Clean cast. chem. borings	30.00 to 31.00
Low phos. 5 ft and under	42.00 to 43.00
Low phos. 2 ft punch'gs	43.00 to 44.00
Elec. furnace bundles	41.00 to 42.00
Heavy turnings	35.00 to 36.00
RR specialties	43.00 to 44.00
Rails 18 in. and under	57.00 to 58.00
Cupola cast.	38.00 to 40.00
Heavy breakable cast.	42.00 to 43.00
Cast iron car wheels	44.00 to 45.00
Malleable	65.00 to 66.00
No. 1 machinery cast	49.00 to 50.00

Cincinnati

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$40.00 to \$41.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 dealer bundles	40.00 to 41.00
No. 2 bundles	26.00 to 27.00
Machine shop turn.	20.00 to 21.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	20.00 to 21.00
Low phos. 18 in. and under	48.00 to 49.00
Rails, random length	50.00 to 51.00
Rails, 18 in. and under	57.00 to 58.00
No. 1 cupola cast	45.00 to 46.00
Heavy breakable cast	40.00 to 41.00
Drop broken cast	49.00 to 50.00

Youngstown

No. 1 hvy. melting	\$47.00 to \$48.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 dealer bundles	47.00 to 48.00
No. 2 bundles	32.00 to 33.00
Machine shop turn.	20.50 to 21.50
Shoveling turnings	20.50 to 21.50
Low phos. plate	49.00 to 50.00

Iron and Steel Scrap

Going prices of Iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Cleveland

No. 1 hvy. melting	\$43.50 to \$44.50
No. 2 hvy. melting	35.50 to 36.50
No. 1 dealer bundles	43.50 to 44.50
No. 1 factory bundles	48.00 to 49.00
No. 2 bundles	29.50 to 30.50
No. 1 busheling	43.50 to 44.50
Machine shop turn.	16.50 to 17.50
Mixed bor. and turn.	21.50 to 22.50
Shoveling turnings	21.50 to 22.50
Cast iron borings	21.50 to 22.50
Cut structural & plates, 2 ft & under	50.00 to 51.00
Drop forge flashings	43.50 to 44.50
Low phos. punch'gs plate	44.50 to 45.50
Foundry steel, 2 ft & under	41.00 to 42.00
No. 1 RR hvy. melting	48.00 to 49.00
Rails 2 ft and under	57.00 to 58.00
Rails 18 in. and under	58.00 to 59.00
Steel axle turnings	27.00 to 28.00
Railroad cast.	53.00 to 54.00
No. 1 machinery cast	51.00 to 52.00
Stove plate	48.00 to 49.00
Malleable	62.00 to 63.00
Stainless	
18-8 bundles	215.00 to 220.00
18-8 turnings	115.00 to 120.00
430 bundles	120.00 to 125.00

Buffalo

No. 1 hvy. melting	\$38.00 to \$39.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 busheling	38.00 to 39.00
No. 1 dealer bundles	38.00 to 39.00
No. 2 bundles	27.00 to 28.00
Machine shop turn.	17.00 to 18.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	17.00 to 18.00
Low phos. plate	42.00 to 43.00
Structural and plate 2 ft and under	46.00 to 47.00
Scrap rails, random lgth.	48.00 to 49.00
Rails 2 ft and under	58.00 to 59.00
No. 1 machinery cast	48.00 to 49.00
No. 1 cupola cast	44.00 to 45.00

St. Louis

No. 1 hvy. melting	\$38.00 to \$39.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 dealer bundles	41.00 to 42.00
No. 2 bundles	29.00 to 30.00
Machine shop turn.	18.00 to 19.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	22.00 to 23.00
No. 1 RR hvy. melting	45.00 to 46.00
Rails, random lengths	48.00 to 49.00
Rails, 18 in. and under	52.00 to 53.00
Angles and splice bars	49.00 to 50.00
RR specialties	47.00 to 48.00
Cupola cast.	47.00 to 48.00
Heavy breakable cast	38.00 to 39.00
Cast iron brake shoes	37.00 to 38.00
Stove plate	44.00 to 45.00
Cast iron car wheels	44.00 to 45.00
Rerolling rails	61.50 to 62.50
Unstripped motor blocks	39.00 to 40.00

Birmingham

No. 1 hvy. melting	\$33.00 to \$34.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	33.00 to 34.50
No. 2 bundles	25.00 to 26.50
Mixed steel scrap	34.50
Bush., new fact., prep'd.	34.50
Bush., new fact., unprep'd	28.50
Machine shop turn.	13.00
Short steel turn.	17.00
Mixed bor. and turn.	13.00
Rails, rerolling	37.00
Cast scrap	\$39.00 to 41.00

New York

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$29.00 to \$30.00
No. 2 hvy. melting	26.00 to 27.00
No. 2 dealer bundles	20.00 to 21.00
Machine shop turnings	11.00 to 12.00
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	15.00 to 16.00
Clean chem. cast. borings	23.00 to 25.00
No. 1 machinery cast	37.00 to 38.00
Mixed yard cast	33.00 to 34.00
Heavy breakable cast	32.00 to 33.00
Stainless	
18-8 prepared solids	190.00 to 195.00
18-8 turnings	80.00 to 85.00
430 prepared solids	75.00 to 80.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$38.00 to \$39.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 dealer bundles	40.00 to 41.00
No. 2 bundles	25.00 to 26.00
No. 1 busheling	38.00 to 39.00
Drop forge flashings	37.00 to 38.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	17.00 to 18.00
Heavy breakable cast	36.00 to 37.00
Mixed cupola cast	43.00 to 44.00
Automotive cast	48.00 to 49.00
Stainless	
18-8 bundles and solids	210.00 to 215.00
18-8 turnings	100.00 to 105.00
430 bundles and solids	105.00 to 110.00

Boston

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$30.00 to \$31.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	30.00 to 31.00
No. 2 bundles	17.00 to 18.00
No. 1 busheling	30.00 to 31.00
Machine shop turn.	9.00 to 10.00
Shoveling turnings	11.00 to 12.00
Clean cast. chem. borings	18.00 to 19.00
No. 1 machinery cast	33.00 to 34.00
Mixed cupola cast	32.00 to 33.00
Heavy breakable cast	30.00 to 31.00
Stove plate	29.00 to 30.00

San Francisco

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$32.00 to \$34.00
No. 2 hvy. melting	30.00 to 32.00
No. 1 dealer bundles	28.00 to 30.00
No. 2 bundles	22.00
Machine shop turn.	15.00
Cast iron borings	15.00
No. 1 cupola cast	45.00

Los Angeles

No. 1 hvy. melting	\$36.00
No. 2 hvy. melting	34.00
No. 1 dealer bundles	33.00
No. 2 bundles	18.00
Machine shop turn.	15.00
Shoveling turnings	17.00
Cast iron borings	17.00
Elec. furn. 1 ft and under (foundry)	47.00
No. 1 cupola cast	47.00

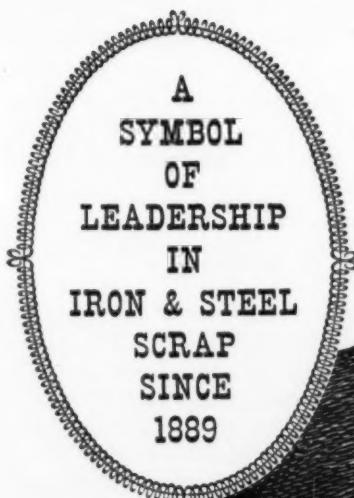
Seattle

No. 1 hvy. melting	\$30.00
No. 2 hvy. melting	28.00
No. 2 bundles	22.00
No. 1 cupola cast	36.00
Mixed yard cast	36.00

Hamilton, Ont.

Brokers buying prices per gross ton on cars:	

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Copper Buyers Are Hedging

Apparently users see less danger in overstocking than getting caught short in case of a strike.

Producers raise their price 1¢ to 30¢ a lb, despite surplus of output over consumption.

■ If actions speak louder than words then a lot of copper users must think there is at least a fair chance of a copper strike this year.

Observers say U. S. copper output is running at record levels. Still, fabricators, mills, and even importers, while reporting good and improving business, say there is nothing outstanding about it.

New Price Tag — You'll still have a tough time finding anyone willing to give his opinion on what is likely to happen when the contracts between the major copper producers and the unions run out on June 30. Yet early this week copper producers decided their market was strong enough to support a 1¢ per lb increase, to 30¢ per lb.

Phelps Dodge made the first announcement, Monday morning effective the next day. Before noon, all major mills had adjusted their price lists.

Who Cares — Both the London Metals Exchange and the Commodity Exchange in New York were off on Monday despite the announced higher producers' price. The number of transactions on Comex in New York was an aver-

age 177. These are the places to hedge on price.

Observers say the London market was more concerned with strike possibilities in Africa and Chile. When these situations settled down, the pressure came off. In the U. S. it appears those who care enough to hedge price already had. But mostly, the trade is more concerned with the supply of metal than its cost.

Steeling Themselves — Some say there is a psychological relationship between copper and steel. Steel buyers are hedging against a possible strike. Apparently copper users are doing the same thing. They believe they have less to lose betting on a copper strike and being wrong, than in being caught short in a rising market.

One observer calls the current market "unwholesome." He believes its strength is entirely speculative. And he says the thinking that because there is likely to be a steel strike there is also likely to be a copper strike is not valid.

Aluminum

Aluminum Co. of America has taken a large step in extending the boundaries for one of the newest fabrication methods — impact extruding.

A new 2500 ton vertical hydraulic press installed at Alcoa's Cresco, Pa., Works will turn out impact extrusions to 12 in. in diam, and to 60 in. long.

Much Bigger — This just about

doubles the limit on the diameter with the former equipment, and boosts length possibilities by 300 pct.

The company sees major uses for giant-size impacts in automotive, aircraft and missile, ordnance, electric, and electronic industries.

The first part turned out on the new press is a missile shell.

New Officers

M. M. Anderson, vice president, Alcoa, is the new president of the Aluminum Assn. The new chairman of the board of directors is S. D. Den Uyl, chairman, Bohn Aluminum & Brass Corp.

Officers of the association's commodity divisions: Extruded products—W. E. Dunlap, Aluminum Extrusions, Inc.; Sheet—Robert T. Farrell, Fairmont Aluminum Co.;

Monthly Average Metal Prices (Cents per lb except as noted)

Average prices of the major nonferrous metals in January based on quotations appearing in THE IRON AGE, were as follows:

Electrolytic copper, del'd	
Conn. Valley	29.00
Copper, Lake	29.00
Straits Tin, New York	99.41
Zinc, E. St. Louis	11.50
Lead, St. Louis	12.42
Aluminum ingot	26.80

Note: Quotations are on going prices

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum pig	24.78	24.00	8/1/68
Aluminum Ingot	28.00	28.10	8/1/68
Copper (E)	30.00	29.00	2/3/68
Copper (CS)	30.00	29.50	1/28/68
Copper (L)	30.00	29.00	2/3/68
Lead, St. L.	11.00	12.00	1/21/68
Lead, N. Y.	12.00	13.00	1/21/68
Magnesium Ingot	36.00	34.00	8/13/68
Magnesium pig	38.25	33.75	8/13/68
Nickel	74.00	64.00	12/6/68
Titanium sponge	182-183	185-200	11/3/68
Zinc, E. St. L.	11.50	11.00	11/7/68
Zinc, N. Y.	12.00	11.00	11/7/68

ALUMINUM: 99% Ingot frt allwd. **COPPER:** (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = Lake. **LEAD:** common grade. **MAGNESIUM:** 99.8% pig Velasco, Tex. **NICKEL:** Port Colbourne, Canada. **ZINC:** prime western. **Tin:** See above; Other primary prices, pg. 133.

Rolled bar, rod, and wire—David B. Miller, Alcoa; Foil—J. H. Konigsberg, Revere Copper and Brass, Inc.; Foundry—John E. Fahlman, Permold Co.

Lead and Zinc

The United Nations conference on lead and zinc, scheduled for Geneva this month, has been postponed. Highly tentative plans for the meeting aim at March or April.

U. S. State Dept. officials are frankly relieved at the action. The current lead-zinc import quotas picture is about as clear and understandable as mud.

Quota Headaches—For instance, by the end of January, the quotas for lead ore through March from Australia, Bolivia and Peru were filled.

Canada and South Africa used about half their quotas in about one-third the quota period. But there is plenty of room from "all other foreign countries."

Out In the Cold—On the other hand, the quotas for lead, zinc, and zinc ore from all other foreign countries was filled on the second day of the period. It looks like having the metal or ore in a warehouse in the U. S. under bond is no edge at all. There is material here now that will not get into the U. S. for several more quarters.

The State Dept. is now attempting a full study of the situation and will make recommendations for smoothing out the system.

Some observers say that if lead-zinc orders start to pick up in this country, the internal pressure to end quotas might have effect this year or next. But it would have to be backed by voluntary restrictions by foreign companies of ore and metal shipments to the U. S.

Tin prices for the week: Jan. 28—100.25; Jan. 29—100.75; Jan. 30—100.75; Feb. 2—101.00; Feb. 3—101.00.*

*Estimate.

Ask Standard

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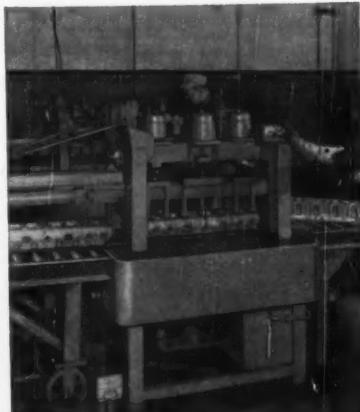
Cylinder blocks are chipped, ground and inspected on Standard Roller Conveyor line.

Eastern foundry simplifies cylinder block handling with roller conveyors

HERE'S another installation in which Standard Roller Conveyors are keeping heavy, bulky components flowing to machining and assembly points with minimum manpower and practically no time loss.

Easy to set up and exceptionally sturdy, Standard Roller Conveyors (live or gravity) can also be job-tailored to your specific materials handling problem — permanent or temporary.

And roller conveyors are only one of the many types of Standard conveyors. Others include belt, slat, chain, pushbar or sectional conveyors as well as spiral chute systems.

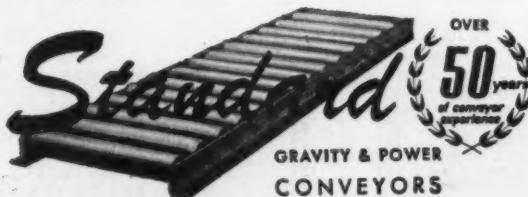


Standard Roller Conveyors are available from stock in a wide range of roller diameters, centers and frames.

Why not take advantage of Standard's half-century of conveyor application experience. Consult STANDARD CONVEYOR COMPANY. General offices: North St. Paul 9, Minnesota. Sales and service in principal cities.



Call the Standard engineer listed in your classified phone book or write direct for Bulletin 68 — Address Dept. M-2.



NONFERROUS PRICES

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship pt., frt. allowed)

Flat Sheet (Mill Finish and Plate) ("F" temper except 6061-0)

Alloy	.032	.081	.136	.250
1100, 3003	45.7	45.8	42.8	43.3
5052	53.1	48.4	46.9	46.0
6061-0	50.1	45.7	43.0	44.9

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6-8	42.7-44.2	51.1-54.8
12-14	42.7-44.2	52.0-55.5
24-26	43.2-44.7	62.8-67.5
36-38	46.7-49.2	86.9-90.5

Screw Machine Stock—2011-T-3

Size*	3/16	3/16-1/4	1/4-1	1/4-1 1/2
Price	62.0	61.2	59.7	57.8

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length*→	72	96	120	144
.019 gage	\$1.411	\$1.884	\$2.353	\$2.823
.024 gage	1.762	2.349	2.937	3.524

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type→	Gage→	.250	.250	.188	.081	.032
AZ31B Stand, Grade	.....	67.9	69.0	77.0	108.1	
AZ31B Spec.	.....	93.3	95.7	108.7	171.8	
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade. (AZ31C)	69.6	70.7	75.6	89.2
Spec. Grade. (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) 37.25 (delivered)

AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

"A" Nickel Monel Inconel

Sheet, CR	126	106	128
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	120	105	121
Seamless tube	157	129	200
Shot, blocks	87	...	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	54.13	.....	51.36	54.32
Brass, Yellow	47.40	47.94	47.34	50.81
Brass, Low	50.13	50.67	50.07	53.44
Brass, R.L.	51.09	51.63	51.03	54.40
Brass, Naval	52.08	.....	45.99	55.49
Muntz Metal	50.15	.....	45.46	.....
Comm. Bz.	52.14	53.14	52.54	55.66
Mang. Bz.	55.82	.....	49.42	.....
Phos. Bz. 5%	73.82	.....	74.30	.....

TITANIUM

(Base prices, f.o.b. mill)

Sheet and strip, commercially pure, \$6.90-\$7.40; alloy, \$14.35; Plate, HR, commercially pure, \$6.00-\$6.76; alloy, \$7.75-\$8.50. Wire, rolled and/or drawn, commercially pure, \$5.50-\$6.00; alloy, \$8.00-\$9.50; Bar, HR or forged, commercially pure, \$4.25-\$4.65; alloy, \$4.25-\$7.15; billets, HR, commercially pure, \$3.55-\$4.10; alloy, \$3.55-\$5.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex. 29.50
Beryllium aluminum 5% Be, Dollar per lb contained Be \$74.75
Beryllium copper, per lb conta'd Be, \$43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading \$71.50
Bismuth, ton lots \$2.25
Cadmium, del'd \$1.45
Calcium, 99.9% small lots \$1.45
Chromium, 99.8% metallic basis \$1.31
Cobalt, 97-99% (per lb) \$1.71 to \$1.82
Germanium, per gm, f.o.b. Miami, Okla., refined \$5.00 to \$42.00
Gold, U.S. Treas., per troy oz. \$35.00
Indium, 99.9%, dollars per troy oz. \$2.25
Iridium, dollars per troy oz. \$70 to \$80
Lithium, 98% \$11.00 to \$14.00
Magnesium, sticks, 100 to 500 lb \$5.00
Mercury, dollars per 76-lb flask \$218 to \$221
Nickel oxide sinter at Buffalo, N.Y., or other U.S. points of entry, contained nickel 69.60
Palladium, dollars per troy oz. \$15 to \$17
Platinum, dollars per troy oz. \$50 to \$55
Rhodium \$120.00 to \$125.00
Silver ingots (¢ per troy oz.) \$0.375
Thorium, per kg. \$43.00
Vanadium \$3.45
Zirconium sponge \$5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 Ingot	No. 115	.....	28.00
	No. 120	.....	27.00
	No. 123	.....	26.00
80-10-10 Ingot	No. 305	.....	32.25
	No. 315	.....	30.25
88-10-2 Ingot	No. 210	.....	39.75
	No. 215	.....	35.50
	No. 245	.....	32.25
Yellow Ingot	No. 405	.....	23.00
	No. 421	.....	24.75

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper max. 24.75-25.00
0.60 copper max. 24.50-24.75
Piston alloys (No. 122 type) 24.25-25.25
No. 12 alum. (No. 2 grade) 21.50-22.00
108 alloy 22.00-22.50
195 alloy 25.00-26.00
13 alloy (60 copper max.) 24.25-24.75
AXS-679 (1 pct zinc) 21.75-22.25

(Effective Feb. 2, 1959)

Steel deoxidizing aluminum notch bar granulated or shot

Grade 1—95-97 1/2%	22.50-23.50
Grade 2—92-95%	21.25-22.25
Grade 3—90-92%	20.25-21.25
Grade 4—85-90%	17.50-18.50

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

Heavy	Turnings
Copper	25
Yellow brass	19
Red brass	22
Comm. bronze	22
Mang. bronze	17 1/2
Free cutting rod ends	18 1/2

Custom Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	25%
No. 2 copper wire	24 1/4
Light copper	22
No. 1 composition	20
No. comp. turnings	19 1/2
Hvy. yellow brass solids	14 1/2
Brass pipe	16
Radiators	16 1/2

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	25%
No. 2 copper wire	24 1/4
Light copper	22
No. 1 composition	20
No. comp. turnings	19 1/2
Cocks and faucets	14 1/2
Clean heavy yellow brass	12 1/2
Brass pipe	14
New soft brass clippings	14 1/2-15
No. 1 brass rod turnings	12

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 copper wire	23 1/4-23 3/4
No. 2 copper wire	21 1/4-21 3/4
Light copper	19 1/4-19 3/4
Auto radiators (unsweated)	13 1/4-14 1/4
No. 1 composition	17-17 1/2
No. 1 composition turnings	16-16 1/2
Cocks and faucets	14-14 1/2
Clean heavy yellow brass	12 1/4-12 3/4
Brass pipe	14-14 1/2
New soft brass clippings	14 1/2-15
No. 1 brass rod turnings	12

Zinc

New zinc clippings 4 1/4-5 1/4

Old zinc 3 1/2-3 3/4

Zinc routings 3 1/4-3 1/2

Old die cast scrap 3 1/4-3 1/2

Nickel and Monel

Pure nickel clippings 52-54

Clean nickel turnings 37-40

Nickel anodes 52-54

Nickel rod ends 52-54

New Monel clippings 30-32

Clean Monel turnings 30-32

Old sheet Monel 26-28

Nickel silver clippings, mixed 18

Nickel silver turnings, mixed 15

Lead

Soft scrap lead 8-8 1/4

Battery plates (dry) 2 1/2-3

Batteries, acid free 2 1/2-2 1/4

Miscellaneous

Block tin 75-77

No. 1 pewter 59-60

Auto babbitt 39-40

Mixer common babbitt 39 1/2-40

Solder joints 13 1/4-13 3/4

Siphon tops 42

Small foundry type 10 1/2-10 3/4

Monotype 10 1/2-10 3/4

Lino. and stereotype 9 1/2-9 3/4

Electrotype 9 1/2-9 3/4

Hand picked type shells 7

Lino. and stereotype, dried 3 1/2-3

Electro dross 2 1/4-2 1/2

EAST

MIDDLE WEST

IRON AGE STEEL PRICES		<i>Italics identify producers listed in key at end of table.</i> Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.												
		BILLETS, BLOOMS, SLABS			PIL- ING	SHAPES STRUCTURALS			STRIP					
Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide- Flange	Hot- rolled	Cold- rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot- rolled	Alloy Cold- rolled		
Bethlehem, Pa.		\$119.00 <i>B3</i>		5.55 <i>B3</i>	8.10 <i>B3</i>	5.55 <i>B5</i>								
Buffalo, N. Y.	\$80.00 <i>R3</i> , <i>B3</i>	\$99.50 <i>R3</i> , <i>B3</i>	\$119.00 <i>R3</i> , <i>B3</i>	6.50 <i>B3</i>	5.55 <i>B3</i>	8.10 <i>B3</i>	5.55 <i>B3</i>	5.10 <i>B3</i> , <i>R3</i>	7.425 <i>S10</i> , <i>R7</i>	7.575 <i>B3</i>				
Phila., Pa.										7.875 <i>P15</i>				
Harrison, N. J.														15.55 <i>C11</i>
Conshohocken, Pa.		\$104.50 <i>A2</i>	\$126.00 <i>A2</i>						5.15 <i>A2</i>		7.575 <i>A2</i>			
New Bedford, Mass.										7.875 <i>R6</i>				
Johnstown, Pa.	\$80.00 <i>B3</i>	\$99.50 <i>B3</i>	\$119.00 <i>B3</i>		5.55 <i>B3</i>	8.10 <i>B3</i>				7.975 <i>T8</i>				
Boston, Mass.										7.875 <i>D1</i>				
New Haven, Conn.										1.425 <i>T8</i>				15.90 <i>T8</i>
Baltimore, Md.														
Phoenixville, Pa.					5.55 <i>P2</i>		5.55 <i>P2</i>							
Sparrows Pt., Md.								5.10 <i>B3</i>		7.575 <i>B3</i>				
New Britain, Bridgeport, Wallingford, Conn.			\$119.00 <i>N8</i>						7.875 <i>W1,S7</i>					
Pawtucket, R. I. Worcester, Mass.										7.975 <i>N7</i> , <i>A5</i>				15.90 <i>N7</i> 15.70 <i>T8</i>
Alton, Ill.								5.30 <i>L1</i>						
Ashland, Ky.								5.10 <i>A7</i>		7.575 <i>A7</i>				
Canton-Massillon, Dover, Ohio		\$102.00 <i>R3</i>	\$119.00 <i>R3</i> , \$114.00 <i>T5</i>						7.425 <i>G4</i>		10.80 <i>G4</i>			
Chicago, Ill. Franklin Park, Ill. Evanston, Ill.	\$80.00 <i>U1</i> , <i>R3</i>	\$99.50 <i>U1</i> , <i>R3,W8</i>	\$119.00 <i>U1</i> , <i>R3,W8</i>	6.50 <i>U1</i>	5.50 <i>U1</i> , <i>W8,P13</i>	8.05 <i>U1</i> , <i>Y1,W8</i>	5.50 <i>U1</i>	5.10 <i>W8</i> , <i>N4,A1</i>	7.525 <i>A1,T8</i> , <i>M8</i>	7.575 <i>W8</i>		8.40 <i>W8</i> , <i>S9,J3</i>	15.55 <i>A1</i> , <i>S9,G4,T8</i>	
Cleveland, Ohio										7.425 <i>A5,J3</i>		10.75 <i>A5</i>	8.40 <i>J3</i>	
Detroit, Mich.			\$119.00 <i>R5</i>						5.10 <i>G3</i> , <i>M2</i>	7.425 <i>M2, S1</i> , <i>D1,P11</i>	7.575 <i>G3</i>	10.80 <i>S1</i>		
Anderson, Ind.										7.425 <i>G4</i>				
Gary, Ind. Harbor, Indiana	\$80.00 <i>U1</i>	\$99.50 <i>U1</i>	\$119.00 <i>U1</i> , <i>Y1</i>		5.50 <i>U1</i> , <i>I3</i>	8.05 <i>U1</i> , <i>J3</i>	5.50 <i>I3</i>	5.10 <i>U1</i> , <i>I3,Y1</i>	7.425 <i>Y1</i>	7.575 <i>U1</i> , <i>I3,Y1</i>	10.90 <i>Y1</i>	8.40 <i>U1</i> , <i>Y1</i>		
Sterling, Ill.	\$80.00 <i>N4</i>				5.50 <i>N4</i>			5.20 <i>N4</i>						
Indianapolis, Ind.										7.575 <i>R5</i>				15.70 <i>R5</i>
Newport, Ky.									5.10 <i>A9</i>				8.40 <i>A9</i>	
Niles, Warren, Ohio Sharon, Pa.		\$99.50 <i>S1/2</i> , <i>C10</i>	\$110.00 <i>C10,S1</i>						5.10 <i>R3</i> , <i>S1</i>	7.425 <i>R3</i> , <i>T4,S1</i>	7.575 <i>R3</i> , <i>S1</i>	10.80 <i>R3</i> , <i>S1</i>	8.40 <i>S1</i>	15.55 <i>S1</i>
Owensboro, Ky.	\$80.00 <i>G5</i>	\$99.50 <i>G5</i>	\$119.00 <i>G5</i>											
Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	\$80.00 <i>U1</i> , <i>P6</i>	\$99.50 <i>U1</i> , <i>C11,P6</i>	\$119.00 <i>U1</i> , <i>C11,B7</i>	6.50 <i>U1</i>	5.50 <i>U1</i> , <i>J3</i>	8.05 <i>U1</i> , <i>J3</i>	5.50 <i>U1</i>	5.10 <i>P6</i>	7.425 <i>J3,B4</i> , <i>E3</i>			8.40 <i>S9</i>	15.55 <i>S9</i>	
Weirton, Wheeling, Follansbee, W. Va.					6.50 <i>U1</i> , <i>W3</i>	5.50 <i>W3</i>		5.50 <i>W3</i>	5.10 <i>W3</i>	7.425 <i>F3</i>	7.575 <i>W3</i>	10.80 <i>W3</i>		
Youngstown, Ohio	\$80.00 <i>R3</i>	\$99.50 <i>Y1</i> , <i>C10</i>	\$119.00 <i>Y1</i>			8.05 <i>Y1</i>		5.10 <i>U</i>	7.425 <i>Y1,R5</i>	7.575 <i>U1</i> , <i>Y1</i>	10.95 <i>Y1</i>	8.40 <i>U1</i> , <i>Y1</i>	15.55 <i>R5</i> , <i>Y1</i>	
Fountain, Cal.	\$90.50 <i>K1</i>	\$100.00 <i>K1</i>	\$140.00 <i>K1</i>		6.30 <i>K1</i>	8.85 <i>K1</i>	6.45 <i>K1</i>	5.825 <i>K1</i>	9.20 <i>K1</i>					
Geneva, Utah		\$99.50 <i>C7</i>			5.50 <i>C7</i>	8.05 <i>C7</i>								
Kansas City, Mo.					5.60 <i>S2</i>	8.15 <i>S2</i>								8.45 <i>S2</i>
Los Angeles, Torrance, Cal.		\$109.00 <i>B2</i>	\$139.00 <i>B2</i>		6.20 <i>C7</i> , <i>B2</i>	8.75 <i>B2</i>		5.85 <i>C7</i> , <i>B2</i>	9.30 <i>C1,R5</i>					9.60 <i>B2</i>
Minnequa, Colo.					5.80 <i>C6</i>			6.20 <i>C6</i>	9.375 <i>C6</i>					
Portland, Ore.					6.25 <i>D2</i>									
San Francisco, Niles, Pittsburg, Cal.		\$109.00 <i>B2</i>			6.15 <i>B2</i>	8.70 <i>B2</i>		5.85 <i>C7</i> , <i>B2</i>						
Seattle, Wash.		\$113.00 <i>B2</i>			6.25 <i>B2</i>	8.80 <i>B2</i>		6.10 <i>B2</i>						
Atlanta, Ga.					5.70 <i>A8</i>			5.10 <i>A8</i>						
Fairfield, Ala. City, Birmingham, Ala.	\$80.00 <i>T2</i>	\$99.50 <i>T2</i>			5.50 <i>T2</i> , <i>R3,C16</i>	8.05 <i>T2</i>		5.10 <i>T2</i> , <i>R3,C16</i>		7.575 <i>T2</i>				
Houston, Lone Star, Texas		\$104.50 <i>S2</i>	\$124.00 <i>S2</i>		5.60 <i>S2</i>	8.15 <i>S2</i>						8.65 <i>S2</i>		

(Effective Feb. 2, 1959)

IRON AGE STEEL PRICES		Sheets								WIRE ROD	TINPLATE†	
		<i>Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.</i>										
EAST	Buffalo, N. Y.	5.10 B3	6.275 B3				7.525 B3	9.275 B3		6.40 W6		
	Claymont, Del.											
	Coatesville, Pa.											
	Conshohocken, Pa.	5.15 A2	6.325 A2				7.575 A2					
	Harrisburg, Pa.											
	Hartford, Conn.											
	Johnstown, Pa.									6.40 B3		
	Fairless, Pa.	5.15 U1	6.325 U1				7.575 U1	9.325 U1				
	New Haven, Conn.											
	Phoenixville, Pa.											
MIDDLE WEST	Sparrows Pt., Md.	5.10 B3	6.275 B3	6.875 B3			7.525 B3	9.275 B3	10.625 B3	6.50 B3	\$10.40 B3	\$9.10 B3
	Worcester, Mass.										6.70 A5	
	Trenton, N. J.											
	Alton, Ill.										6.60 L1	
	Ashland, Ky.	5.10 A7		6.875 A7	6.775 A7		7.525 A7					
	Canton-Massillon, Dover, Ohio			6.875 R1, R3								
	Chicago, Joliet, Ill.	5.10 W8, A1					7.525 U1, W8			6.40 A5, R3, W8		
	Sterling, Ill.										6.50 N4, K2	
	Cleveland, Ohio	5.10 R3, J3	6.275 R3, J3	7.65 R3*	6.775 R3		7.525 R3, J3	9.275 R3, J3		6.40 A5		
	Detroit, Mich.	5.10 G3, M2	6.275 G3, M2				7.525 G3	9.275 G3				
WEST	Newport, Ky.	5.10 A1	6.275 A1									
	Gary, Ind. Harbor, Indiana	5.10 U1, I3, Y1	6.275 U1, I3, Y1	6.875 U1, I3	6.775 U1, I3, Y1	7.225 U1	7.525 U1, Y1, I3	9.275 U1, Y1		6.40 Y1	\$10.40 U1, Y1	\$9.10 I3, U1, Y1
	Granite City, Ill.	5.20 G2	6.375 G2	6.975 G2								7.85 U1, Y1
	Kokomo, Ind.			6.975 C9						6.50 C9		
	Mansfield, Ohio	5.10 E2	6.275 E2			7.225 E2						
	Middletown, Ohio		6.275 A7	6.875 A7	6.775 A7	7.225 A7						
	Niles, Warren, Ohio Sharon, Pa.	5.10 R3, S1	6.275 R3	6.875 R3	6.775 S1	7.225 S1*, R3	7.525 R3, S1	9.275 R3,			\$9.10 R3	
	Pittsburgh, Midland, Butler, Donora, Aliquippa, McKeesport, Pa.	5.10 U1, J3, P6	6.275 U1, J3, P6	6.875 U1, J3	6.775 U1, J3, P6		7.525 U1, J3	9.275 U1, J3	10.625 U1, J3	6.40 A5, J3, P6	\$10.40 W5, J3	\$9.10 U1, J3
	Portsmouth, Ohio	5.10 P7	6.275 P7							6.40 P7		
	Weirton, Wheeling, Follansbee, W. Va.	5.10 W3, W5	6.275 W3, F3, W5	6.875 W3, W5	6.775 W3, W5	7.225 W3, W5	7.525 W3	9.275 W3			\$10.40 W5, W3	\$9.10 W5, W3
SOUTH	Youngstown, Ohio	5.10 U1, Y1	6.275 Y1	7.50 J3*	6.775 Y1		7.525 Y1	9.275 Y1		6.40 Y1		
	Fontana, Cal.	5.825 K1	7.40 K1				8.25 K1	10.40 K1			\$11.05 K1	\$9.75 K1
	Geneva, Utah	5.20 C7										
	Kansas City, Mo.										6.65 S2	
	Los Angeles, Torrance, Cal.										7.20 B2	
MIDDLE WEST	Minnequa, Colo.										6.65 C6	
	San Francisco, Niles, Pittsburgh, Cal.	5.88 C7	7.225 C7	7.625 C7						7.20 C7	\$11.05 C7	\$9.75 C7
	Atlanta, Ga.											
	Fairfield, Ala. Alabama City, Ala.	5.10 T2, R3	6.275 T2, R3	6.875 T2, R3	6.775 T2					6.40 T2, R3	\$10.50 T2	\$9.20 T2
EAST	Houston, Texas										6.65 S2	

* Electrogalvanized sheets.

(Effective Feb. 2, 1959)

*7.425 at Sharon-Niles is 7.225

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS					PLATES			WIRE		
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.725 B3	9.025 B3	8.30 B3					
	Buffalo, N. Y.	5.675 R3,B3	5.675 R3,B3	7.70 B5	6.725 B3,R3	9.025 B3,B5	8.30 B3	5.30 B3				8.00 W6
	Claymont, Del.							5.30 C4		7.50 C4	7.95 C4	
	Coatesville, Pa.							5.30 L4		7.50 L4	7.95 L4	
	Conshohocken, Pa.							5.30 A2	6.375 A2	7.50 A2	7.95 A2	
	Harrisburg, Pa.							5.30 P2	6.475 P2			
	Milton, Pa.	5.825 M7	5.825 M7									
	Hartford, Conn.			8.15 R3		9.325 R3						
	Johnstown, Pa.	5.675 B3	5.675 B3		6.725 B3		8.30 B3	5.30 B3		7.50 B3	7.95 B3	8.00 B3
	Fairless, Pa.	5.825 U1	5.825 U1		6.875 U1							
	Newark, Camden, N. J.			8.10 W10, P10		9.20 W10, P10						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 W10 8.15 J3	6.80 N8	9.175 N8						
	Sparrows Pt., Md.		5.675 B3					5.30 B3		7.50 B3	7.95 B3	8.10 B3
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 B5, C14		9.325 A5,B5						8.30 A5, W6
	Spring City, Pa.			8.10 K4		9.20 K4						
	Alton, Ill.	5.875 L1										8.20 L1
	Ashland, Newport, Ky.							5.30 A7,A9		7.50 A9	7.95 A7	
MIDDLE WEST	Canton, Massillon, Mansfield, Ohio	6.15* R3		7.65 R3,R2	6.725 R3 6.475 T5	9.025 R3,R2 8.775 T5		5.30 E2				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 U1,R3, N4,P13 5.875 L1	5.675 U1,R3, N4,P13, W8, B5,L2,N9	7.65 A5, W10,W8, B5,L2,N9	6.725 U1,R3, W8	9.025 A5, W10,W8, L2,N8,B5	8.30 U1,W8, R3	5.30 U1,A1, W8,I3	6.375 U1	7.50 U1, W8	7.95 U1, W8	8.00 A5,R3, W8,N4, K2,W7
	Cleveland, Ohio Elyria, Ohio	5.675 R3	5.675 R3	7.65 A5,C13, C18		9.025 A5, C13,C18	8.30 R3	5.30 R3,J3	6.375 J3		7.95 R3,J3	8.00 A5, C13,C18
	Detroit, Mich.	5.675 G3	5.675 G3	7.90 P3 7.85 P6,B5 7.65 R5	6.725 R5,G3	9.025 R5 9.225 B5,P3, P8	8.30 G3	5.30 G3		7.50 G3	7.95 G3	
	Duluth, Minn.											8.00 A5
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 U1,I3, Y1	5.675 U1,I3, Y1	7.65 R3,J3	6.725 U1,I3, Y1	9.025 R3,M4	8.30 U1,Y1	5.30 U1,I3, Y1	6.375 J3, II	7.50 U1, Y1	7.95 U1, Y1,I3	8.10 M4
	Granite City, Ill.							5.40 G2				
	Kokomo, Ind.		5.775 C9									8.10 C9
	Sterling, Ill.	5.775 N4	5.775 N4					5.30 N4				8.10 K2
	Niles, Warren, Ohio Sharon, Pa.			7.65 C10	6.725 C10,	9.025 C10		5.30 R3,S1		7.50 S1	7.95 R3, S1	
	Owensboro, Ky.	5.675 G5			6.725 G5							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 U1,J3	5.675 U1,J3	7.65 A5,B4, R3,J3,C11, W10,S9,C8, M9	6.725 U1,J3, C11,B7	9.025 A5, R10,R3,S9, C11,C8,M9	8.30 U1,J3	5.30 U1,J3	6.375 U1,J3	7.50 U1, J3,B7	7.95 U1, J3,B7	8.00 A5, J3,P6
	Portsmouth, Ohio											8.00 P7
	Weirton, Wheeling, Follansbee, W. Va.						5.30 W5					
	Youngstown, Ohio	5.675 U1,R3, Y1	5.675 U1,R3, Y1	7.65 A1,Y1, P2	6.725 U1,Y1	9.025 Y1,F2	8.30 U1,Y1	5.30 U1, R3,Y1		7.50 Y1	7.95 U1,Y1	8.00 Y1
	Emeryville, Cal. Fontana, Cal.	6.425 J5 6.375 K1	6.425 J5 6.375 K1		7.775 K1		9.00 K1	6.10 K1		8.30 K1	8.75 K1	
	Geneva, Utah							5.30 C7				7.95 C7
	Kansas City, Mo.	5.925 S2	5.925 S2		6.975 S2		8.55 S2					8.25 S2
	Los Angeles, Terrance, Cal.	6.375 C7,B2	6.375 C7,B2	9.10 R3,P14, S12	7.775 B2	11.00 P14, S12	8.625 B2					8.95 B2
	Minneapolis, Colo.	6.125 C6	6.125 C6					6.15 C6				8.25 C6
	Portland, Ore.	6.425 O2	6.425 O2									
	San Francisco, Niles, Pittsburgh, Cal.	6.375 C7 6.425 B2	6.375 C7 6.425 B2				8.675 B2					8.95 C7,C6
	Seattle, Wash.	6.425 B2,N6	6.425 B2				8.675 B2	6.29 B2		8.40 B2	8.85 B2	
SOUTH	Atlanta, Ga.	5.875 A8	5.875 A8									8.00 A8
	Fairfield City, Ala. Birmingham, Ala.	5.675 T2,R3, C16	5.675 T2,R3, C16				8.30 T2	5.30 T2,R3			7.95 T2	8.00 T2,R3
	Houston, Ft. Worth, Lone Star, Texas	5.925 S2	5.925 S2		6.975 S2		8.55 S2	5.40 S2		7.60 S2	8.05 S2	8.25 S2

* Merchant Quality—Special Quality 35¢ higher.
† Merchant Quality—Special Quality 35¢ higher.

(Effective Feb. 2, 1959)

* Special Quality.

THE IRON AGE, February 5, 1959

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1	Acme Steel Co., Chicago
A2	Alan Wood Steel Co., Conshohocken, Pa.
A3	Allegheny Ludlum Steel Corp., Pittsburgh
A4	American Cladmetals Co., Carnegie, Pa.
A5	American Steel & Wire Div., Cleveland
A6	Angel Nail & Chaplet Co., Cleveland
A7	Armo Steel Corp., Middletown, Ohio
A8	Atlantic Steel Co., Atlanta, Ga.
A9	Acme-Newsport Steel Co., Newport, Ky.
B1	Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2	Bethlehem Pacific Coast Steel Corp., San Francisco
B3	Bethlehem Steel Co., Bethlehem, Pa.
B4	Blair Strip Steel Co., New Castle, Pa.
B5	Bliss & Laughlin, Inc., Harvey, Ill.
B6	Brook Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7	A. M. Byers, Pittsburgh
B8	Braeburn Alloy Steel Corp., Braeburn, Pa.
C1	Calstrip Steel Corp., Los Angeles
C2	Carpenter Steel Co., Reading, Pa.
C4	Claymont Products Dept., Claymont, Del.
C6	Colorado Fuel & Iron Corp., Denver
C7	Columbia Geneva Steel Div., San Francisco
C8	Columbia Steel & Shafing Co., Pittsburgh
C9	Continental Steel Corp., Kokomo, Ind.
C10	Copperweld Steel Co., Pittsburgh, Pa.
C11	Crucible Steel Co. of America, Pittsburgh
C13	Cuyahoga Steel & Wire Co., Cleveland
C14	Compressed Steel Shafting Co., Readville, Mass.
C15	G. O. Carlson, Inc., Thorndale, Pa.
C16	Connors Steel Div., Birmingham
C18	Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.
D1	Detroit Steel Corp., Detroit
D2	Driver Co., Newark, N. J.
D3	Driver Harris Co., Harrison, N. J.
D4	Dickson Weatherproof Nail Co., Evanston, Ill.
E1	Eastern Stainless Steel Corp., Baltimore
E2	Empire-Reeves Steel Corp., Mansfield, O.
E3	Enamel Products & Plating Co., McKeesport, Pa.
F1	Firth Sterling, Inc., McKeesport, Pa.
F2	Fitzsimons Steel Corp., Youngstown
F3	Follansbee Steel Corp., Follansbee, W. Va.

G2	Granite City Steel Co., Granite City, Ill.
G3	Great Lakes Steel Corp., Detroit
G4	Greer Steel Co., Dover, O.
G5	Green River Steel Corp., Owensboro, Ky.
H1	Hann Furnace Corp., Detroit
I2	Ingersoll Steel Div., Chicago
I3	Inland Steel Co., Chicago
I4	Interlake Iron Corp., Cleveland
J1	Jackson Iron & Steel Co., Jackson, O.
J2	Jessop Steel Corp., Washington, Pa.
J3	Jones & Laughlin Steel Corp., Pittsburgh
J4	Jodlyn Mfg. & Supply Co., Chicago
J5	Judson Steel Corp., Emeryville, Calif.
K1	Kaiser Steel Corp., Fontana, Calif.
K2	Keystone Steel & Wire Co., Peoria
K3	Koppers Co., Granite City, Ill.
K4	Keystone Drawn Steel Co., Spring City, Pa.
L1	Laclede Steel Co., St. Louis
L2	La Salle Steel Co., Chicago
L3	Lone Star Steel Co., Dallas
L4	Lukens Steel Co., Coatesville, Pa.
M1	Mahoning Valley Steel Co., Niles, O.
M2	McLouth Steel Corp., Detroit
M3	Mercer Tube & Mig. Co., Sharon, Pa.
M4	Mid States Steel & Wire Co., Crawfordsville, Ind.
M6	Mystic Iron Works, Everett, Mass.
M7	Milton Steel Products Div., Milton, Pa.
M8	Mill Strip Products Co., Evanston, Ill.
M9	Moltrup Steel Products Co., Beaver Falls, Pa.
N1	National Supply Co., Pittsburgh
N2	National Tube Div., Pittsburgh
N4	Northwestern Steel & Wire Co., Sterling, Ill.
N6	Northwest Steel Rolling Mills, Seattle
N7	Newman Crosby Steel Co., Pawtucket, R. I.
N8	Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9	Nelson Steel & Wire Co.
O1	Oliver Iron & Steel Co., Pittsburgh
O2	Oregon Steel Mills, Portland
P1	Page Steel & Wire Div., Monessen, Pa.
P2	Phoenix Steel Corp., Phoenixville, Pa.
P3	Pilgrim Drawn Steel Div., Plymouth, Mich.
P4	Pittsburgh Coke & Chemical Co., Pittsburgh
P5	Pittsburgh Screw & Bolt Co., Pittsburgh
P6	Pittsburgh Steel Co., Pittsburgh
P7	Portsmouth Div., Detroit Steel Corp., Detroit
P8	Plymouth Steel Co., Detroit
P9	Pacific States Steel Co., Niles, Cal.
P10	Precision Drawn Steel Co., Camden, N. J.
P11	Production Steel Strip Corp., Detroit
P13	Phoenix Mfg. Co., Joliet, Ill.
P14	Pacific Tube Co.
P15	Philadelphia Steel and Wire Corp.
R2	Reliance Div., Eaton Mfg. Co., Massillon, O.
R3	Republic Steel Corp., Cleveland
R4	Roehling Sons Co., John A., Trenton, N. J.
R5	Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6	Rodney Metals, Inc., New Bedford, Mass.
R7	Rome Strip Steel Co., Rome, N. Y.
S1	Sharon Steel Corp., Sharon, Pa.
S2	Sheffield Steel Div., Kansas City
S3	Shenango Furnace Co., Pittsburgh
S4	Simonds Saw and Steel Co., Fitchburg, Mass.
S5	Sweet's Steel Co., Williamsport, Pa.
S7	Stanley Works, New Britain, Conn.
S8	Superior Drawn Steel Co., Monaca, Pa.
S9	Superior Steel Div. of Copperweld Steel Co., Carnegie, Pa.
S10	Seneca Steel Service, Buffalo
S11	Southern Electric Steel Co., Birmingham
S12	Sierra Drawn Steel Corp., Los Angeles, Calif.
T1	Tonawanda Iron Div., Tonawanda, N. Y.
T2	Tennessee Coal & Iron Div., Fairfield
T3	Tennessee Products & Chem. Corp., Nashville
T4	Thomas Strip Div., Warren, O.
T5	Timken Steel & Tube Div., Canton, O.
T7	Texas Steel Co., Fort Worth
T8	Thompson Wire Co., Boston
U1	United States Steel Corp., Pittsburgh
U2	Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3	Ulbrich Stainless Steels, Wallingford, Conn.
U4	U. S. Pipe & Foundry Co., Birmingham
W1	Wallingford Steel Co., Wallingford, Conn.
W2	Washington Steel Corp., Washington, Pa.
W3	Weirton Steel Co., Weirton, W. Va.
W4	Wheatland Tube Co., Wheatland, Pa.
W5	Wheeling Steel Corp., Wheeling, W. Va.
W6	Wickwire Spencer Steel Div., Buffalo
W7	Wilson Steel & Wire Co., Chicago
W8	Wisconsin Steel Div., S. Chicago, Ill.
W9	Woodward Iron Co., Woodward, Ala.
W10	Wyckoff Steel Co., Pittsburgh
W12	Wallace Barnes Steel Div., Bristol, Conn.
Y1	Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

STANDARD T. & C.	BUTTWELD												SEAMLESS											
	1/2 in.		3/4 in.		1 in.		1 1/4 in.		1 1/2 in.		2 in.		2 1/2-3 in.		2 in.		2 1/2 in.		3 in.		3 1/2-4 in.			
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. B3	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50	12.25	+4.25	13.75	+4.50	14.25	+4.25	15.75	+4.50	16.25	+4.25
Youngstown R3	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	14.25	+2.25	15.75	+2.50	16.25	+2.25	17.75	+2.50	18.25	+2.25
Fontana K1	*10.75	+26.00	*7.75	+22.00	*4.25	+17.50	*1.75	+16.75	*1.25	+15.75	*0.75	+15.25	*0.75	+15.50	*0.75	+15.25	*0.75	+15.50	*0.75	+15.25	*0.75	+15.50	*0.75	+15.25
Pittsburgh J3	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	14.25	+2.25	15.75	+2.50	16.25	+2.25	17.75	+2.50	18.25	+2.25
Alton, Ill. L1	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50	12.25	+4.25	13.75	+4.50	14.25	+4.25	15.75	+4.50	16.25	+4.25
Sharon M3	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	14.25	+2.25	15.75	+2.50	16.25	+2.25	17.75	+2.50	18.25	+2.25
Fairless N2	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50	12.25	+4.25	13.75	+4.50	14.25	+4.25	15.75	+4.50	16.25	+4.25
Pittsburgh N1	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	14.25	+2.25	15.75	+2.50	16.25	+2.25	17.75	+2.50	18.25	+2.25
Wheeling W5	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	14.25	+2.25	15.75	+2.50	16.25	+2.25	17.75	+2.50	18.25	+2.25
Wheatland W4	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	14.25	+2.25	15.75	+2.50	16.25	+2.25	17.75	+2.50	18.25	+2.25
Youngstown Y1	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	14.25	+2.25	15.75	+2.50	16.25	+2.25	17.75	+2.50	18.25	+2.25
Indiana Harbor Y1	1.25	+14.0	4.25	+10.0	7.75	+5.50	10.25	+4.75	10.75	+3.75	11.25	+3.25	12.75	+3.50	13.25	+3.25	14.75	+3.50	15.25	+3.25	16.75	+3.50	17.25	+3.25
Lorain N2	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	14.25	+2.25	15.75	+2.50	16.25	+2.25	17.75	+2.50	18.25	+2.25
EXTRA STRONG PLAIN ENDS																								
Sparrows Pt. B3	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	+1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50	14.25	*0.25	14.75	*1.50	15.25	*0.25	15.75	*1.50	16.25	*0.25
Youngstown R3	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	16.25	1.25	16.75	1.75	17.25	1.25	17.75	1.75	18.25	1.25
Fairless N2	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	+1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50	14.25	*0.25	14.75	*1.50	15.25	*0.25	15.75	*1.50	16.25	*0.25
Fontana K1	*6.25	*2.25	1.75	0.75	1.25	1.25	1.75	1.25	2.25	1.25	2.25	1.25	2.25	1.25	2.25	1.25	2.25	1.25	2.25	1.25	2.25	1.25	2.25	1.25
Pittsburgh J3	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	16.25	1.25	16.75	1.75	17.25	1.25	17.75	1.75	18.25	1.25
Alton, Ill. L1	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	+1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50	14.25	*0.25	14.75	*1.50	15.25	*0.25	15.75	*1.50	16.25	*0.25
Sharon M3	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	16.25	1.25	16.75	1.75	17.25	1.25	17.75	1.75	18.25	1.25
Pittsburgh N1	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	16.25	1.25	16.75	1.75	17.25	1.25	17.75	1.75	18.25	1.25
Wheeling W5	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	16.25	1.25	16.75	1.75	17.25	1.25	17.75	1.75	18.25	1.25
Wheatland W4	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	16.25	1.25	16.75	1.75	17.25	1.25	17.75	1.75	18.25	1.25
Youngstown Y1	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	16.25	1.25	16.75	1.75	17.25	1.25	17.75	1.75	18.25	1.25
Indiana Harbor Y1	5.75	*8.0	9.75	*4.0	12.75	0.50	13.25	+8.75	13.75	0.25	14.25	0.75	14.75	*0.50	15.25	0.75	15.75	*0.50	16.25	0.75	16.75	*0.50	17.25	0.75
Lorain N2	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	16.25	1.25	16.75	1.75	17.25	1.25	17.75	1.75	18.25	1.25

Threads only, butt-welded and seamless, 2 1/4 pt. higher discount. Plain ends, butt-welded and seamless, 3-in. and under, 5 1/2 pt. higher discount. Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: 1/2, 3/4 and 1-in., 2 pt.; 1 1/4, 1 1/2 and 2-in., 3 pt.; zinc price in range

To identify producers, see Key on preceding page

TOOL STEEL

F.o.b. mill	W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	—	\$1.84	T-1
18	4	1	—	5	—	2.545	T-4
18	4	2	—	—	—	2.005	T-2
1.5	4	1.5	8	—	—	1.20	M-1
6	4	3	6	—	—	1.59	M-3
6	4	2	5	—	—	1.345	M-2
High-carbon chromium	—	—	—	—	—	.955	D-3
Oil hardened manganese	—	—	—	—	—	.505	O-2
Special carbon	—	—	—	—	—	.38	W-1
Extra carbon	—	—	—	—	—	.38	W-1
Regular carbon	—	—	—	—	—	.325	W-1
Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.	—	—	—	—	—	—	—

ELECTRICAL SHEETS

F.o.b. Mill Cents Per Lb	22-Gage	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length)	
			Semi- Processed	Fully Processed
			9.875	11.70
Field	—	—	11.20	11.70
Armature	11.70	—	11.99	12.40
Elect.	12.40	—	12.475	—
Special Motor	—	—	13.05	13.55
Motor	13.55	—	14.15	14.65
Dynamo	14.65	—	15.20	15.70
Trans. 72	15.70	—	—	—
Trans. 65	16.30	—	—	—
Grain Oriented				
Trans. 58	16.80	—	Trans. 80	19.70
Trans. 52	17.85	—	Trans. 73	20.20
		—	Trans. 64	20.70

Producing points: Beech Bottom (W-5); Brackenridge (A-3); Granite City (G-2); Indiana Harbor (I-3); Mansfield (E-2); Newport, Ky. (A-9); Niles, O. (S-1); Vandergrift (U-1); Warren, O. (R-3); Zanesville, Butler (A-7).

CLAD STEEL

Base prices, cents per lb f.o.b.

Stainless Type	Plate (L4, Ct, A3, J2)			Sheet (J2)	
	Cladding	10 pct	15 pct	20 pct	20 pct
302	—	—	—	37.50	—
304	28.80	31.55	34.30	40.00	—
316	42.20	46.25	50.25	58.75	—
321	34.50	37.75	41.05	47.25	—
347	40.80	44.65	48.55	57.00	—
405	24.60	26.90	29.25	—	—
410	22.70	24.85	27.00	—	—
430	23.45	25.65	27.90	—	—

CR Strip (S9) Copper, 10 pct, 2 sides, 42.05; 1 side, 35.55.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Tie Plates	Track Bolts Untreated
Bessemer U-1	5.75	6.725	7.25	—	15.35	—
Cleveland R-3	—	—	—	10.10	—	—
St. Chicago R-3	—	—	—	—	—	—
Easley T-2	5.75	6.725	—	—	—	—
Fairfield T-2	6.725	—	10.10	6.875	—	—
Gary U-1	5.75	—	—	6.875	—	—
Ind. Harbor I-3	—	—	—	10.10	—	—
Johnstown B-3	—	—	—	—	—	—
Joliet U-1	6.725	—	—	7.25	—	—
Kansas City S-2	—	—	—	10.10	15.35	—
Lackawanna B-3	5.75	6.725	7.25	—	6.875	—
Lebanon B-3	—	—	—	7.25	—	—
Minnequa C-6	5.75	7.225	7.25	10.10	6.875	15.35
Pittsburgh P-5	—	—	—	—	—	14.75
Pittsburgh J-3	—	—	—	10.10	—	—
Seattle B-2	—	—	—	6.75	15.85	—
Steelton B-3	5.75	—	7.25	—	6.875	—
Struthers Y-1	—	—	—	10.10	—	—
Torrance C-7	—	—	—	6.75	—	—
Williamsport S-5	6.725	—	—	10.10	—	—
Youngstown R-3	—	—	—	—	—	—

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

		Carloads per 1000	
Super duty, Mo., Pa., Md., Ky.		\$185.00	
High duty (except Salina, Pa., add \$5.00)		140.00	
Medium duty		125.00	
Low duty (except Salina, Pa., add \$2.00)		103.00	
Ground fire clay, net ton, bulk		22.50	
Silica Brick			
Mt. Union, Pa., Ensley, Ala.		\$158.00	
Childs, Hays, Latrobe, Pa.		163.00	
Chicago District		168.00	
Western Utah		183.00	
California		165.00	
Super Duty			
Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville		163.00-168.00	
Silica cement, net ton, bulk, Latrobe		29.75	
Silica cement, net ton, bulk, Chicago		26.75	
Silica cement, net ton, bulk, Ensley, Ala.		27.75	
Silica cement, net ton, bulk, Mt. Union		25.75	
Silica cement, net ton, bulk, Utah and Calif.		39.00	

Chrome Brick

		Per net ton
Standard chemically bonded, Balt.		\$109.00
Standard chemically bonded, Curtin, Calif.		119.00
Burned, Balt.		103.00

Magnesite Brick

Standard, Baltimore \$140.00

Chemically bonded, Baltimore \$119.00

St. % to 1/2-in. grains	
Domestic, f.o.b. Chewalah, Wash.	\$73.00
Luning, Nev.	—
in bulk	46.00
in sacks	52.00-54.00

Dead Burned Dolomite

Per net ton

F.o.b. bulk, producing points in:

Pa., W. Va., Ohio \$16.75

Missouri Valley \$15.00

Midwest \$17.00

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nail	Wire		Fence Posts		Single Loop Bale Ties		Galv. Barbed and Twisted Barbless Wire		Merchant Wire Arms		Merchant Wire Gals.	
		Col	Cal	Col	Cal	Col	Cal	Col	Cal	Col	Cal	Col	Cal
Alabama City R-3	173	187	—	212	193	9.00	9.55	—	—	—	—	—	—
Alliquipps J-3**	173	190	—	190	193	9.00	9.675	—	—	—	—	—	—
Atlanta A-5*	175	192	—	214	193	9.00	9.425	—	—	—	—	—	—
Bartowville K-2**	175	192	—	178	193	9.00	9.775	—	—	—	—	—	—
Buffalo W-6	—	—	—	—	—	—	—	—	—	—	—	—	—
Chicago R-3	173	190	—	172	193	9.00	9.325	—	—	—	—	—	—
Cleveland A-5	173	187	—	187	193	9.00	9.55	—	—	—	—	—	—
Crawf'dav. M-4**	175	187	—	214	193	9.00	9.775	—	—	—	—	—	—
Donora, Pa. A-5	173	187	—	212	193	9.00	9.55	—	—	—	—	—	—
Duluth A-5	173	187	—	212	193	9.00	9.55	—	—	—	—	—	—
Fairfield, Ala. T-2	173	187	—	214	195*	9.00	9.65*	—	—	—	—	—	—
Galveston D-4	173	187	—	217	198	9.25	9.80	—	—	—	—	—	—
Houston S-2	178	192	—	219	203	9.10	9.775	—	—	—	—	—	—
Jacksonville M-2	184-1	197	—	196	199	9.00	9.675	—	—	—	—	—	—
Johnstown S-2**	173	190	—	177	192	9.00	9.55	—	—	—	—	—	—
Joliet, Ill. A-5	173	187	—	212	193	9.00	9.55	—	—	—	—	—	—
Kokomo C-5	175	187	—	214	195*	9.00	9.65*	—	—	—	—	—	—
Los Angeles B-2**	178	192	—	217	198*	9.25	9.80	—	—	—	—	—	—
Kansas City S-2*	178	192	—	182	197	9.00	9.80	—	—	—	—	—	—
Minnequa C-6	178	192	—	193	197	9.00	9.85	—	—	—	—	—	—
Palmers, Mass. W-6	192	210	—	213	216	9.00	10.15	—	—	—	—	—	—
Pittsburgh, Cal. C-7	192	210	—	193	200	9.00	9.55	—	—	—	—	—	—
Rankin, Pa. A-5	173	187	—	187	193	9.00	9.50	—	—	—	—	—	—
S. San Fran. C-6	173	187	—	236	240	9.00	9.50	—	—	—	—	—	—
Sparrows Pt. B-3**	175	187	—	214	198	9.00	9.775	—	—	—	—	—	—
Struthers, O. Y-1	179	187	—	—	—	9.00	9.20	—	—	—	—	—	—
Worcester A-5	179	187	—	—	—	9.00	9.35	—	—	—	—	—	—
Williamsport S-5	179	187	—	—	—	9.00	9.55	—	—	—	—	—	—
Williamsport S-5	179	187	—	—	—	9.00	9.55	—	—	—	—	—	—
Youngstown R-5	179	187	—	—	—	9.00	9.55	—	—	—	—	—	—

*

PIG IRONDollars per gross ton, f.o.b.,
subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Beaz.	Low Phos.
Birmingham, Pa. <i>R6</i>	68.00	68.50	69.00	69.50	.....
Birmingham <i>R3</i>	62.00	62.50*	.....	.....	.....
Birmingham <i>W9</i>	62.00	62.50*	66.50	.....	.....
Birmingham <i>U4</i>	62.00	62.50*	66.50	.....	.....
Buffalo <i>R3</i>	66.00	66.50	67.00	67.50	.....
Buffalo <i>H1</i>	66.00	66.50	67.00	67.50	.....
Buffalo <i>H6</i>	66.00	66.50	67.00	67.50	.....
Chester <i>P2</i>	66.50	67.00	67.50	.....	.....
Chicago <i>I4</i>	66.00	66.50	66.50	67.00	.....
Cleveland <i>A5</i>	66.00	66.50	66.50	67.00	71.00†
Cleveland <i>R3</i>	66.00	66.50	66.50	67.00	.....
Duluth <i>I4</i>	66.00	66.50	66.50	67.00	71.00†
Erie <i>I4</i>	66.00	66.50	66.50	67.00	71.00†
Everett <i>M6</i>	67.50	68.00	68.50	.....	.....
Fontana <i>K1</i>	75.00	75.50	.....	.....	.....
Geneva, Utah <i>C7</i>	66.00	66.50	.....	.....	.....
Granite City <i>G2</i>	67.90	68.40	68.90	.....	.....
Hubbard <i>V1</i>	.....	.....	66.50	.....	.....
Ironton, Utah <i>C7</i>	66.00	66.50	.....	.....	.....
Midland <i>C11</i>	66.00	66.50	.....	.....	.....
Minnequa <i>C6</i>	68.00	68.50	69.00	.....	.....
Monessen <i>P6</i>	66.00	66.50	.....	.....	.....
Neville Is. <i>P4</i>	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda <i>T1</i>	66.50	67.00	67.50	.....	.....
Sharpenay <i>S3</i>	66.00	66.50	67.00	.....	.....
So. Chicago <i>R3</i>	66.00	66.50	66.50	67.00	.....
So. Chicago <i>W8</i>	66.00	66.50	66.50	67.00	.....
Swedenborg <i>A2</i>	68.00	68.50	69.00	69.50	.....
Toledo <i>I4</i>	66.00	66.50	66.50	67.00	.....
Troy, N. Y. <i>R3</i>	68.00	68.50	69.00	69.50	73.00
Youngstown <i>Y1</i>	.....	.....	66.50	.....	.....

DIFFERENTIALS: Add .75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except 1 low phos., 1.75 to 2.00 pct); 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct; \$2 per ton for 0.50 to 0.75 pct nickel; \$1 for each additional 0.25 pct nickel. Add \$1.00 for 0.31-0.69 pct phosphorus.

Silvery Iron: Buffalo (6 pct), *H1*, \$79.25; Jackson *J1*, *J4* (*Globe Div.*), \$78.00; Niagara Falls (15.01-15.50), \$101.00; Kukul (14.01-14.50), \$103.50; (15.51-16.00), \$106.50. Add \$1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add \$1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phosphorus) \$64.00. Add \$1.00 premium for all grades silvery to 18 pct.

* Intermediate low phosphorus.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingets, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	25.00	31.50	29.00	32.75	33.25	34.50	51.25	41.50	48.25	—	22.25	—	22.50
Billets, forging	—	37.75	38.75	39.50	42.50	42.00	64.50	48.75	57.75	29.25	29.25	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	49.50	75.75	57.50	67.25	35.00	35.00	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25-	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	48.25	48.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	55.00	80.75	65.50	78.25	40.25	40.25	42.50	48.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	47.00	71.75	54.50	63.75	33.25	33.25	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; Vandergrift, Pa., *U1*; Washington, Pa., *W2*, *J2*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Detroit, *M2*; Louisville, O., *R5*.

Strip: Midland, Pa., *C11*; Waukegan, Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; Leechburg, Pa., *U2*; Bridgeville, Pa., *A3*; Dunkirk, N. Y., *A3*; Massillon, O., *R5*; S. Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5*, *R3*; Ft. Wayne, *I4*; Detroit, *R5*; Gary, *U1*; Harrison, N. J., *D3*; Youngstown, *R5*; Sharon, Pa., *A7*; Wallingford, Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); New Bedford, Mass., *R6*; Gary, *U1* (25¢ per lb. higher).

Wires: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *I4*; Newark, N. J., *D2*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*; Detroit, *R5*.

Structural: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*; S. Chicago, *U1*.

Plates: Baltimore, *E1*; Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Vandergrift, Pa., *U1*; Gary, *U1*; G5; Bridgeport, Conn., *N8*.

Forging billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*; Detroit, *R5*; Munhall, Pa., S. Chicago, *U1*; Owensboro, Ky., *G5*; Bridgeport, Conn., *N8*.

(Effective Feb. 2, 1959)

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FERROALLOY PRICES

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si	38.00
0.02% C	41.00
0.05% C	39.00
0.10% C	38.50
0.20% C	38.25
4.00-4.50% C, 60-70% Cr, 1-2% Si	28.75
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si	28.25
0.025% C (Simplex)	36.75
8% max C, 50-55% Cr, 6% max Si	25.75
4 1/2% max C, 50-55% Cr, 2% max Si	26.50

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule.

Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 97.25% min. Cr, 1% max. Fe.
0.10% max. C \$1.29
9 to 11% C, 88-91% Cr, 0.75% Fe... 1.38

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (1/8" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.
Carloads \$1.15
Ton lots 1.17
Less ton lots 1.19

Low Carbon Ferrochrome Silicon

(Cr 39-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in. x down, packed.

Price is sum of contained Cr and contained Si.
Cr Si
Carloads, bulk 28.25 14.60
Ton lots 33.50 16.05
Less ton lots 35.10 17.70

Calcium-Silicon

Per lb of alloy, lump, delivered, packed.
36-33% Cr, 60-65% Si, 3.00 max. Fe.
Carloads, bulk 24.00
Ton lots 27.95
Less ton lots 29.45

Calcium-Manganese-Silicon

Cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.
Carloads, bulk 23.00
Ton lots 26.15
Less ton lots 27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe 1/2 in. x 12 mesh.
Ton lots 21.15
Less ton lots 22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5: 38-42% Cr, 17-19% Si, 8-11% Mn, packed.
Carload lots 18.45
Ton lots 19.95
Less ton lots 21.20

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.
Carload packed 19.20
Ton lots to carload packed 21.15
Less ton lots 22.40

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	12.25
Johnstown, Pa.	12.25
Neville Island, Pa.	12.25
Sheridan, Pa.	12.25
Philo, Ohio	12.25
S. Duquesne	12.25
Add or subtract 0.1¢ for each 1 pct Mn above or below base content.	
Briquets, delivered, 66 pct Mn:	
Carloads, bulk	14.80
Ton lots packed in bags	17.20

Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa., and Neville Island, Pa.	
Manganese Silicon	
16 to 19% 3% max.	\$100.50
19 to 21% 3% max.	102.50
21 to 23% 3% max.	105.00

Manganese Metal

2 in. x down, cents per pound of metal delivered.	
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.	
Carload, packed	45.75
Ton lots	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.	
Carloads	34.00
Ton lots	36.00
250 to 1999 lb	38.00
Premium for Hydrogen - removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, packed, del'd Mn 85-90%.	
Carloads Ton Less	
0.07% max. C, 0.06% (Bulk) P, 90% Mn	37.15 39.95 41.15
0.07% max. C	35.10 37.90 39.10
0.10% max. C	34.35 37.15 38.35
0.15% max. C	33.60 36.40 37.60
0.30% max. C	32.10 34.90 36.10
0.50% max. C	31.60 34.40 35.60
0.75% max. C, 80.85% Mn, 5.0-7.0% Si	28.60 31.40 32.60

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

Carloads bulk	12.80
Ton lots, packed	14.45
Carloads, bulk, delivered, per lb of briquet	15.10
Briquets, packed pallets, 3000 lb up to carloads	16.30

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct., f.o.b. Niagara Falls, N. Y., \$93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.	
Ton lots, Carloads,	
98.25% Si, 0.50% Fe	24.95 23.65
98% Si, 1.0% Fe	24.45 23.15

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.
Carloads, bulk

Ton lots, packed	8.00
Carloads, bulk	10.80

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si....	14.60
65% Si....	15.75
90% Si....	20.00

Ferrovanadium

50-55% V delivered, per pound, contained V, in any quantity.

Openhearth	3.20
Crucible	3.30
High speed steel	3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

Cast	\$2.05
Turnings	\$2.95
Distilled	\$3.75

100 to 1999 lb. 2.40 3.30 4.55

Alnifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y.

per lb.	
Carloads, bulk	9.85¢
Ton lots	11.20¢

Calcium molybdate, 43.6-46.6% f.o.b. Langelo, Pa., per pound contained Mo

.....	\$1.50
.....	3.95

Ferrocolumbium, 50-60% lb, 2 in. x D, delivered per pound contained CB.

Ton lots	\$3.90
Less ton lots	3.95

Ferro-tantalum-columbium, 20% Ta, 40% CB, 0.30% C, del'd ton lots, 2-in. x D per pound contained CB.

Ton lots	\$3.40
plus Ta	

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langelo, Pa., per pound contained Mo.

.....	\$1.76
.....	1.35

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$5.00 unitage, per gross ton

.....	\$120.00
10 tons to less carload	131.00

Ferrotitanium, 40% regular grade

0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti	
Less ton lots	1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, car-load per net ton

.....	\$240.00
.....	nominal

Ferrotungsten, 1/4 x down packed, less carloads contained

W, ton lots delivered	\$2.15
(nominal)	

Molybde oxide, briquets per lb contained Mo, f.o.b. Langelo, Pa.

.....	\$1.49
bags, f.o.b. Washington, Pa., Langelo, Pa.	1.38

Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.

Carload, bulk lump	18.50¢
Ton lots, packed lump	20.50¢
Less ton lots	21.00¢

Vanadium oxide, 86-89% V₂O₅, per pound contained V₂O₅

.....	\$1.38
.....	1.38

Zirconium silicon, per lb of alloy

15-40% del'd, carloads, bulk	26.25¢
12-15%, del'd lump, bulk	9.25¢

Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B

2000 lb carload	\$5.50
.....	5.50

Bortram, f.o.b. Niagara Falls, Ton lots per pound

Less ton lots, per pound	50¢
.....	

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.

Ton lots per pound	14.00¢
.....	

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots

zero plus

**... and Carlson
special stainless steels
withstand the extremes
of another launching**

WHEN this missile "lifts off," Carlson special stainless steel plates help launch it into space. These plates are the high strength, precipitation-hardening grades. And there are sound reasons why these grades are used.

First, with Armco 17-4PH, 17-7PH and PH15-7 Mo* it is easier to attain the high physical properties and resistance to elevated temperatures required in space flight engineering. Simplified low temperature heat treatment will develop a Rockwell hardness of C40 to C50. Tensile strengths, so vital in missile components, range from 180,000 to 220,000 psi in plates.

Second, only Carlson produces these Armco grades in the heavier plate thicknesses. For applications where high strength at high temperatures and ease of fabrication are important, get plates in these grades from Carlson. We will be glad to work with you on specific applications.

*17-4PH, 17-7PH and PH15-7 Mo are trade marks of Armco Steel Corporation

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District Sales Offices in Principal Cities



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FLANGES • FORGINGS • BARS and SHEETS (No. 1 Finish)

Photo of Atlas missile courtesy
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REBUILT—GUARANTEED ELECTRICAL EQUIPMENT STEEL MILL SPECIALS

- (8) 2500-HP Westinghouse Motors 600-VDC, 160/320 R.P.M.
- (1) 2200-HP Westinghouse Motor 600-VDC, 72/132 R.P.M.
- (6) 1800-HP Westinghouse Motors 600-VDC, 400 R.P.M.
- (2) 400-HP S.S. Motors, 300-VDC, 1000 R.P.M., encl. F.V.
- (2) 400-HP Allis-Chalmers Motors 600-VDC, 300/600 R.P.M.

★ ★ ★ ★ ★

- (1) S. & S. 4-unit M-G Set consists of (1) 3200-HP syn. motor 11,000/2200-V, 3-P, 60 cyl., (1) 1650-KW (2) 750-KW, 600-VDC generators, complete with exciters and motor starters.
- (8) 800-KW, 3-unit Allis-Chalmers M-G Sets (2) 1750-KW Gen., 360/720-DC, (1) 5000-HP syn. motor 13,000/6900/4000-V.
- (1) 1875-KW Whse. M-G Set, 250-VDC, 64 R.P.M. with 2700-HP syn motor 13,000/6900/4000-V.
- ★ ★ ★ ★ ★
- (1) 2500-HP Allis-Chalmers, mill type Slip Ring motor 300 RPM, 2200-V.
- (1) 1800-HP Whse. Mill type slip ring motor, 252 R.P.M., 2300-V.
- (2) 1800-HP G.E. slip ring motors, mill type, 450 R.P.M., 6600/4000-V.

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40- and 50-Ton Capacity

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THE CLEARING HOUSE

California Dealers Want Equipment

Used machinery sellers in Southern California are looking for large lathes, boring mills, and presses.

They are wanted for missile development contracting.

Used machinery dealers in the Southern California market still have "wanted" signs up. They need large lathes, boring mills, and presses.

The equipment is needed for missile development work. And there's little around on the West Coast. Here is what's wanted: Lathes with a 5 ft to 10 ft swing, and 12-ft-and-up centers; boring mills with 14-ft-and-up swing; and a few big presses in the 750-ton-and-up class.

Electronics Users — Sheet metal equipment ranks in the best seller class. Biggest number of inquiries comes from electronic firms. In Southern California new electronics plants are opening at a terrific rate.

First Half Gains — Though first-quarter business hasn't moved off dead center yet, estimates of first-half business range from 10 pct to 15 pct better than the like period of last year. This forecast seems based more on hope than facts.

Lathes, milling machines, shears, and press brakes are better movers. Some dealers say prices are holding firm; others complain of considerable softness.

Subcontractor Snag — According to one extreme pessimist, many subcontractors bought tools last fall in

anticipation of orders from major contractors. They haven't received the subcontract yet. So they can't use the equipment they already have — why even think of buying more?

There's still some complaining about tools made available to government contractors from surplus pools. This is business that would otherwise go to dealers, they claim.

Chins Up — The Northern California outlook is not for a happy first quarter. But dealers are trying hard to hold their chins up for a better one to follow.

In Seattle, the used machinery market is very much alive. Dealers report heightened interest in almost every type of machine tool. Emphasis is on the lighter machines for missile development work.

With the area's misslemaking business increasing, demand is up for used light milling machines, drill presses, and boring machines.

Nationwide Sales Up

Sharp gains were made in national sales of used machinery during last December.

Sales volume in December, according to the Machinery Dealers National Assn., was more than 10 pct better than the same month in '57. In addition, December '58 sales were 54 pct above those of the previous December.

During the final month of 1958, says the MDNA, dealers increased their inventories by 1.4 pct with a dollar value increase of the same percent.

CONSIDER GOOD USED EQUIPMENT FIRST

BALERS

P-133 Logemann, Box Size 60" x 22" x 18½"
P-115 Logemann, Box Size 100" x 48" x 24"

BENDING ROLLS

12" x ¾" Billes & Jones Pyramid Type
22" x ¾" BILLES PYRAMID TYPE—LATE

BRAKE-PRESS TYPE

12" x ¼" Airtherm Model No. 3814

BUILDINGS

50' x 325' x 24' Under Span

70' x 760' x 39' Under Span

CRAVES—OVERHEAD ELECTRIC TRAVELING

7½ ton P&H	60' Span 230 Volt D.C.
8 ton P&H	55' Span 230/3/60
10 ton P&H	50' Span 230 Volt D.C.
10 ton P&H	39' Span 230 Volt D.C.
10 ton Milwaukee	57' Span 230 Volt D.C.
10 ton Shaw	48' Span 230 Volt D.C.
10 ton Shaving	50' Span 230/3/60 A.C.
10 ton Shaw	120' Span 230 Volt D.C.
15 ton P&H	50' Span 230 Volt D.C.
15 ton N-B-P	100' Span 220/3/60 A.C.
120 ton Shepard Niles	77' Span 230/3/60

DIEING MACHINE

50 ton Henry & Wright, 4½" Stroke

DRAW BENCHES

10,000 lb. Draw Bench, 50 ft. Draw

35,000 lb. Draw Bench, 41 ft. Draw

50,000 lb. Draw Bench, 20 ft. Draw

FORGING MACHINES

1" to 5" Acme, Ajax, National

GEAR REDUCERS

3000 H.P. United (2), Ratio 16.2-1 & 11.6-1

HAMMERS—BOARD DROP—STEAM DROP—STEAM FORGING

300 lb. to 12,000 lb. Incl.

• Manufacturing

LEVELERS—ROLLER

12" Waterbury Farrel 9 Rolls 6" Dia.
24" McKay 17 Rolls 2½" Dia.

60" Guide 17 Rolls 4½" Dia.

84" Bliss 17 Rolls 5½" Dia.

POLISHER

National #464 Polisher for 24" wide strip

PRESS—EMBOSSING & COINING

#2664 Toledo 600 ton, 2" Stroke

PRESSES—HYDRAULIC

300 ton Southark, Bed 28" x 28", Stroke 25"

500 ton Watson Stillman Piercing Press 48" x 72"

1000 ton HPM Fastraverse, Bed 36" x 36"

400 ton HPM Bed 68" x 68", Stroke 40"

PUNCH—BEAM

#14 Thomas Guillotine Type 225 ton Cap.

With 50 ft. Spacing Tables

PUNCH & SHEAR COMBINATIONS

21½" Buffalo Universal Ironworker

EF Cleveland, 60" Throat

ROLL—CORRUGATING

33 Stansco, 24" Dia. Rolls, For Sheets 144"x10"

ROLLING MILLS

6" x 5" Portion Flat Wire Mill Line

24" x 9" x 9" 4-High Strip Mill

34" x 7" Six Roll Cluster Mill

10" x 14" Single Stand Two High

10" x 16" Single Stand Two High

12" x 12" Single Stand Two High

12" x 16" Single Stand Two High

18" x 14" Two Stand Two High

20" x 36" Single Stand Two High

26" x 60" Single Stand Two High

ROLLS—FORMING

6 Stand Dahlstrom \$450-6 for stock to 4½" wide

18 Stand Custom Built, 2½ Shaft, will take 36" wide

ROLLS—PLATE STRAIGHTENERS

100 Bertsch Seven Rolls 9" Dia.

72" Niles 7 Rolls 9" Dia. Motor Driven

SHEARS—ALLIGATOR

24" All Steel, Cap. 4" Rd., 3½" Sq.

24" Metal Cast Steel, Cap. 2" x 12" Cold

SHEAR LINE

Cleveland Cut off Machine, Leveler, Coil Cradle Handles steel sheets 45" wide up to 1/16" thick

SHEARS—SQUARING

6" x 14" Ga. Edwards, Motor Drive—LATE

10" x 36" Cincinnati

10" x 36" Niagara

10" x 36" Bertsch

SLITTERS

36" Yoder, 4½" Dia. Arbor

30" Paxton Slitting Line, 6" Dia. Arbor

STRAIGHTENERS

Torrington #1734 12-Roll, Cap. 1½" Rd. 1-9/16"

½" Shuster Straightener, 12 Ft. Cut off

SWAGING MACHINES

#31 Swinging 2-Hole, Cap. 2" Tube, ½" Solid

#32A Fema, Cap. 3½" Tube, 1½" Solid, 10" Dia.

Length, With Hydraulic Feed

TESTING MACHINES

20,000 lb. Baldwin Univ. Hydraulic

50,000 lb. Baldwin Southark Compression

100,000 lb. Olsen Universal Beam Type

500,000 lb. Olsen Super DeLuxe Compression

TUBE REDUCERS

1½" Reducer for steel

2½" Tube Reducer for steel

WIRE DRAWING MACHINES

Type B Morgan 4-Block, Cap. #5 Rod down

Scudder 3-Block 29" Dia.

Synco BBS-11 Fine Wire Drawing Machine

Superior 7-Draft Cone Type, Cap. 14 Gs. down to .0364

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Tube Cutoff

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3 phase—60 cycle

SLIP RING

Qu.	H.P.	Make	Type	Volts	Speed
1	1750	G.E.	M-579B	4800	1800
1	1500	G.E.	MT	6000	1187
1	800	Whse.	CW	550	1776
1	700	A.C.		2300	500
1	600	Whse.	CW-4-32D-15	440	1775
1	500	G.E.	MT-412	220/440	480
1	500	Whse.	CW	550	1800
1	350	Cr. Wh.	Size 718R	208/416	1745
1	350	G.E.	IM-17A	220/440	720
1	350	Whse.	CW-10-39C-15	440	720
1	250	G.E.	IM-16	220/440	875
1	250	G.E.	MT563Y	220/440	875
1	250	A.C.		550	600
1	250	Whse.	CW	2200	450
1	250	Cr. Wh.	Size 29Q	2200	350
1	250	G.E.	MT-124T	4000	257
1	250	G.E.	IM-12	220/440	1800
1	200	Whse.	CW-890	2300	1775
1	200	Whse.	CW-874D	220/440	885
1	200	Cr. Wh.	SR-26QB	440	505
2	200	G.E.	IM-17A	2200	435
3	100	A.C.		440	695
1	800	G.E.	KT-573	2200	1180
1	500	G.E.	PT-559AY	2200	3600
2	500	Whse.	CS-1210	2300	863/445
1	500	Whse.	CS-715I	2200	500
1	600	G.E.	610H	6800/4000	3585
1	300	Whse.	CR-1002	2300/440	600
2	200	Whse.	CS-855B	D.P.	220/440
1	150	G.E.	FT-538	2200	875
1	150	Whse.	CS	440	580
1	125	Whse.	CS-764C	220/440	1180
3	100	Whse.	CS-760I	2200/440	1100
1	6000	G.E.	ATI	2200/6600	600
1	3500	G.E.	ATI	P.F.	2200/6600/4000
1	2500	Whse.	ATI	2200	720
1	2000	G.E.	ATI	2200	900
2	1750	G.E.	ATI	2200	3600
1	1750	G.E.	TS	2300/4600	900
1	1350	G.E.	TS	2200/1200	600
2	700	G.E.	TS	2300/3600	1300
1	200	G.E.	IM	440/2200	580
1	350	Whse.	1.6P.F.	440	900
2	350	G.E.	ATI 1.6P.F.	2200	150
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 2—28 3-HIGH ROLL STANDS.
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 1—3500 HP MOTOR, 11000/8000 volts, 3 phase, 60 cycle, 514 RPM, synchronous, never used.

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2" National susp. slides
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 90 ton No. 75 Bliss hornung
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40 H.P. Motor and Controls

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25,000 lbs. 4" O.D. x 3½" I. D.

20' Random Lengths

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L.H. Turret Hd., Side Hd., M.D.
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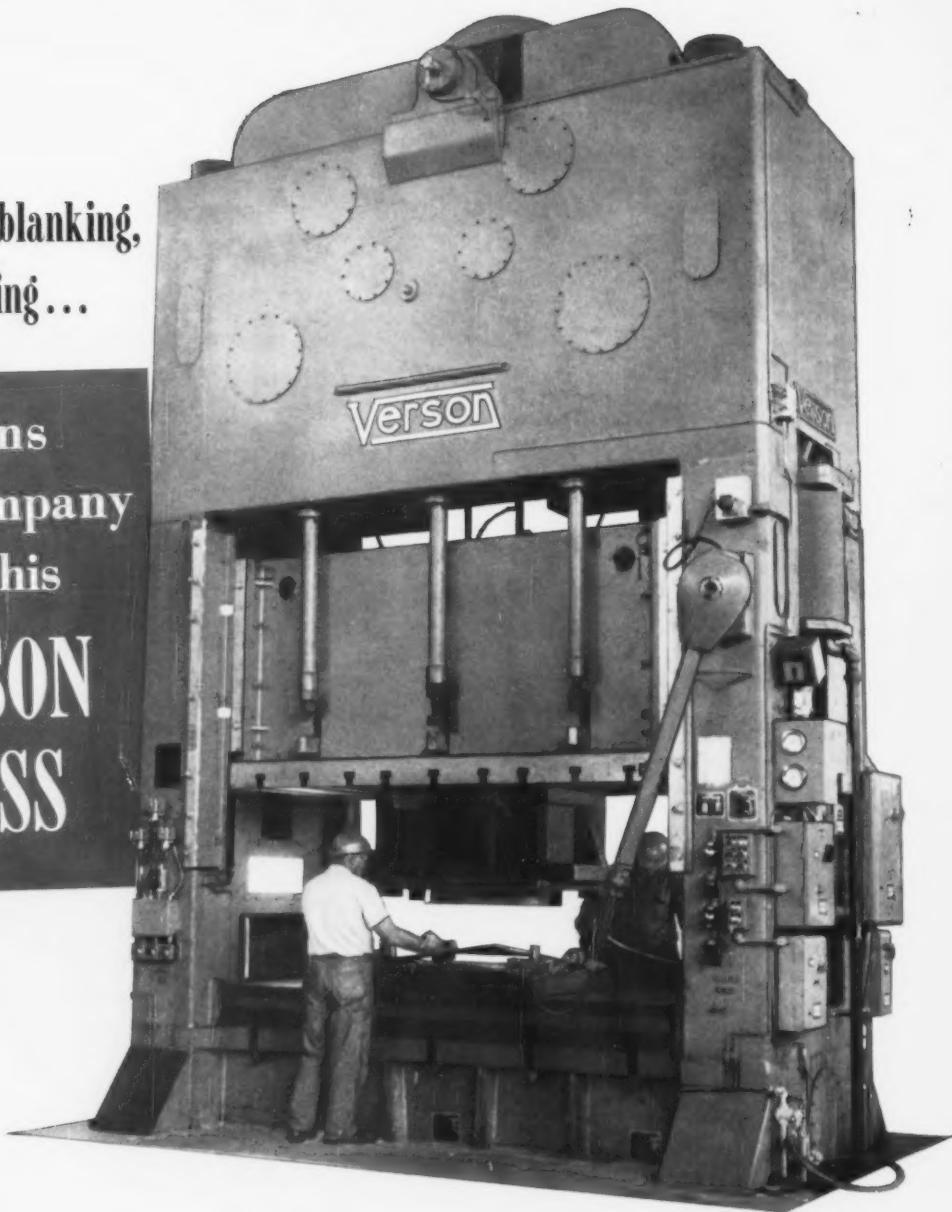
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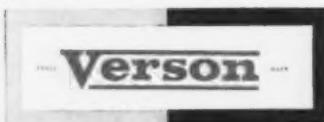
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